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PLACE OF MATERNAL RUBELLA IN THE AETIOLOGY OF CONGENITAL HEART DISEASE*

BY

MAURICE CAMPBELL, M.D., F.R.C.P.

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In 1941 Gregg, of Australia, made the clinical observation that maternal rubella in early pregnancy was followed by congenital cataract and malformation of the heart. This discovery was important not only in itself but by stimulating a wide interest in the aetiology of congenital heart disease—a problem that had seemed to be without a clue to its solution. Swan and Tostevin, of Adelaide, with their colleagues added the production of deaf-mutism, and by a widespread inquiry in South Australia confirmed Gregg's observations and provided fuller information about their cases of congenital heart disease (Swan *et al.*, 1943). Evans (1944) added the production of anomalies of the incisors, defects of the dental enamel, and delayed eruption; at 4 years, however, the children have acquired a full complement of teeth. These defects and less commonly others—for example, microcephaly and mental defect—may occur alone or together.

Retrospectively, Lancaster (1951) pointed out that, at any time after Knibbs (1917) had recorded the erratic incidence of deaf-mutism among Australian children in his statistical reports, it would have been possible to incriminate some epidemic disease that affected prenatal life as one significant cause of deaf-mutism. Lancaster (1954) extended his inquiries to other countries that have included statistics about blindness and deaf-mutism since this was recommended at an international conference in 1872. The most pertinent findings were in Australia, New Zealand, and Iceland, and he thought that the relative isolation of many communities in these countries might account for the larger and therefore more noticeable epidemics at longer intervals. In Iceland, for example, he found that 10 deaf children were born in 1941, compared with an annual average of 1.2 in 1935–47, following 2,347 notified cases of rubella in 1940 and 1941 compared with 60 cases annually. And in Birmingham 9 deaf mutes were born in September and 12 in October, 1940, compared with a monthly average of under 2.5 for the previous ten years.

At first cataract seemed to be the most frequent malformation and deaf-mutism the least so, for Murphy (1947) found 161 examples of cataract, 117 of heart malformations, and 88 of deaf-mutism among 295 cases. But, of these three conditions, cataract is the least likely to be overlooked at an early age and deafness may not be recognized until the child is 4 years of age. Now that there has been time to get more accurate information, this order of frequency has been reversed, and Julia Bell (1959) found 263 examples of deafness, 210 of heart malformation, and 149 of cataract among 421 cases.

The mechanism by which these malformations are produced is of great interest. The virus of rubella circulates in the maternal blood during the incubation period and for a short time after, and passes through the chorionic epithelium to the blood-stream of the foetus. Tondury (1953) examined 10 human embryos from mothers who had been attacked by rubella between the fifth and seventh weeks of pregnancy, and found that the virus had a strikingly selective action on the heart and on three epidermal structures of the foetus. In these last three the respective cells are severely damaged, becoming swollen and vacuolated and sometimes destroyed, producing a central cataract (most often bilateral), deafness from damage to the internal ear and the cochlea (less often bilateral), and defects of the dental enamel. Although Tondury found malformations of the heart in 5 of the 10 embryos, he found less evidence of how these were produced.

In this paper I shall try to answer four questions. (1) What is the risk to the child after maternal rubella during pregnancy? (2) When the heart is affected, what malformations are most common? (3) Looking at congenital heart disease as a whole, what proportion is due to maternal rubella? (4) How important are any other infections—viral or bacterial?

1. Increased Risk of Having Children with Malformations

The risk of having a malformed child for the mother with rubella during the early weeks of her pregnancy is of great practical importance. It has given rise to wide differences of opinion that are not yet resolved, though it became clear at an early stage that the risk was greatest in the first 12 weeks. It is generally agreed that the risk is mainly confined to this period, that there is some much smaller risk during the 13th to 16th weeks, and that after this there is no more risk than normally. It is the magnitude of the risk that is still uncertain. Some early estimates of 70 to 90% have been suspected because the authors were more likely to know about the infection when the child was malformed than when it was normal. Prospective rather than retrospective studies are essential for a true picture.

One of the best of these prospective inquiries is that by Hill *et al.* (1958) with the methods that Hill and Galloway (1949) had suggested earlier and used on a smaller scale. They found that the risk of a malformed

*Contribution to the Symposium on the Aetiology of Congenital Heart Disease at the Third European Congress of Cardiology, Rome, September 18–24, 1960.

child if the mother had rubella during the first four weeks of her pregnancy was 50%, during the second four weeks 25%, during the third four weeks 17%, during the fourth four weeks 11%, and after this negligible.

Lamy and Seror (1956), in another excellent prospective inquiry, found a higher risk of 50% (70% if abortions were included) during the first 12 weeks. They did not give separate figures for each of the first four months, but it appears from their table that the risk was 100% during the first month (when for some unexplained reason there were less than half the expected number of mothers affected); 55% (82% with abortions) during the second month; and 37% (47% with abortions) during the third and fourth months, combined because the percentage during the fourth month in a rather small number of cases was higher than during the third month.

Lundström (1952), in an inquiry covering 1,067 women in the maternity hospitals in Sweden, found that the number of children with malformations was 10% in the first four weeks, 14% in the second four weeks, and 10% in the third four weeks, but it seems likely that this included only those malformations that were readily diagnosed at an early stage.

Ministry of Health Report

Since this address was delivered, a valuable report from the Ministry of Health has been published (Manson *et al.*, 1960). It deals mainly with the degree of risk for the mother who has rubella, or other virus infections (see below), during the relevant pregnancy, but does not attempt any diagnosis of the types of congenital heart disease concerned. It deals with nearly all the pregnancies in England and Scotland during 1950–2 and gives a more optimistic picture than the first two inquiries discussed.

The percentages of abortions and stillbirths and of deaths during the first two years of life were twice as high among those where there had been rubella during the first 12 weeks of the pregnancy as among the controls (Table I); after two years there were only 84% instead of 93% of living children. If, however, rubella occurred after the first 12 weeks of pregnancy there was no difference in these figures. Among the stillbirths after the "rubella" pregnancies there were

TABLE I.—*Abortions, Stillbirths, Neonatal Deaths, and Malformations after Maternal Rubella and in Controls*

	Abortions	Stillbirths	Deaths before 2 years	Children Alive at 2 years	With Major Malformations
Maternal rubella in first 12 weeks	5·0%	4·5%	6·9%	83·6%	15·8%
Controls	2·4%	2·4%	2·4%	92·8%	2·3%

From Manson *et al.* (1960).

slightly more major malformations. Among the children dying during their first two years, major malformations were found in 46% compared with 34% of the controls; malformations are now an important cause of neonatal deaths in nearly all groups.

Among the 547 children who were born alive after maternal rubella, 37 (7%) had "major" congenital malformations compared with 2.3% among the controls: the number with malformations was increased to 15.8% in those where the maternal rubella occurred during the first 12 weeks. The numbers for each of the four weeks of the first trimester did not vary greatly—15.6% for the first four, 19.7% for the second four, and 13.0% for the third four weeks. In the fourth four weeks (13th to 16th) the number of malformations was much less (4.2%) but was still increased compared with 2.3% among the controls, and at later stages of the pregnancy maternal rubella was without any significant effect.

Congenital heart disease (7%) was 14 times as common as among the controls, cataract (5.5%) was 78 times as common, and deafness (2.7%) was nearly 40 times as common; in fact, the last was even commoner than this, for more cases were discovered when the children were re-examined at the age of 4 years. These malformations, either alone or in combination, were as usual the most common, but there were three cases each of mental defect, œsophageal atresia, and pyloric stenosis—that is, four times, six times, and three times as common as among the controls.

The percentages quoted are, in my view, minimal figures—for two reasons. Apart from the 37 "major" defects there were 18 with "suspicious" defects, mainly heart murmurs or backwardness in development or speech. Secondly, deafness often went undetected at the age of 2 years, when the main examinations were made, and was revealed when they were re-examined at 4 years of age; so that its incidence was increased from under 3 to 14%, and even to 35% in a smaller group of 57 children examined fully by Jackson and Fisch (1958). For these reasons the percentages for the incidence of major malformations should be increased by about half, from 15.8 to 24%, and these additions have been made, in parentheses, in the fifth column of Table II: it is still a minimal figure, though it will include all those with the major degrees of deafness.

Comparison of These Series

The results obtained in these three series are summarized in Table II. I have added the cases

TABLE II.—*Incidence of Malformations According to Period of Maternal Rubella*

Weeks of Pregnancy	No. of Reported Cases (Bell, 1959)	Percentage of Births with Malformations in Prospective Studies			
		Lamy and Seror (1956)	Hill *et al.* (1958)	Manson *et al.* (1960)	General Estimate (M.C.)
1st to 4th	103	100	50	16 (+8)*	30–70
5th ,, 8th	175	55	25	20 (+10)	25–55
9th ,, 12th	100	37	17	13 (+7)	20–40
13th ,, 16th	25		11	4 (+2)	10–25
Later	14		0	0	0
1st to 12th	—	50	31	16 (+8)	25–50
Controls	—	2·7		2·3	

* See text for explanation of the added figures in parentheses.

reported by Julia Bell (1959); though these give no information about the absolute degree of risk, they help with the relative risks during the different periods. Bell found 103 in the first four weeks, 175 in the second four weeks, 100 in the third four weeks, only 25 in the fourth four weeks, and 14 subsequently, but many or all of these 14 may have been only coincidences.

When the methods used and the care taken in these three series are considered it is surprising to find so much difference between the results, for there does not seem to be any technical reason for this. The series of Lamy and Seror and of Hill *et al.* are smaller than that of Manson *et al.* (50, 68, and 277 cases of maternal rubella during the first four months

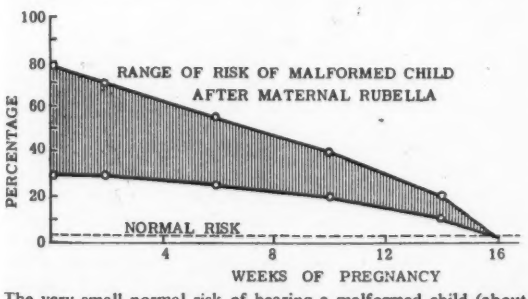
respectively) but have the advantage of a more uniform assessment of the malformations. Possibly they have included more minor malformations, but, apart from the incidence being higher in these first two, it diminishes greatly during the first three four-week periods—to about half during the second four weeks and to about a third during the third four weeks—while in the series of Manson *et al.* it does not change much until the fourth month (see Table II).

The most obvious difference is that Lamy and Seror collected their cases during a local epidemic round Paris in 1953–4, and a relatively large number of adults must have been affected, for in the women written to during their pregnancy the incidence of rubella was between 0.5 and 1 per 1,000. This suggests that in some particular epidemics more women may be affected and more children with malformations may be born, as I suspect was the case in the epidemic of 1940 (see below).

Can malformations arise when the mother is exposed to rubella without an overt attack? Coffey and Jessop (1959), in a Dublin epidemic, found an incidence of malformations of 3% among the exposed mothers—some increase, but much less than the 30%, among the affected mothers. Lamy and Seror, however, found no increase of malformations among the exposed mothers, but there were more abortions. Probably a mother who is herself immune to any overt manifestations of rubella may acquire the infection enough to risk damaging the foetus. Certainly malformations may follow very mild infections, and do so as often or nearly as often as after severe infections.

The different malformations may be greater risks at different periods (Bourquin, 1948; Bamatter, 1949; and others). Cataract is thought to be most common with infection during the fifth and sixth weeks but may be as early as the third week; malformations of the heart especially from the fifth to ninth weeks; and deafness especially during the eighth to twelfth weeks. Jackson and Fisch (1958) found as many as 55% affected with deafness between the ninth and twelfth weeks, inclusive, when the children were carefully examined and followed up to the age of 4 years, but this was much higher than the figure for the larger number found by Manson *et al.* (1960) for the same period.

It seems, therefore, that the risk of a malformation lies somewhere within a rather wide range—between 30 and 70% during the first four weeks, 25 and 55% during the second four weeks, 20 and 40% during the third four weeks, and 10 and 25% during the fourth four weeks (see Table II and Fig.). These figures may be increased by another four-tenths if abortions are included. Possibly the lower figures are generally more accurate and the higher figures are found in particular epidemics. The problem of a therapeutic abortion, therefore, remains a difficult one for the doctor during the first three months of pregnancy and must be settled according to individual circumstances. After the third month the question does not arise.



The very small normal risk of bearing a malformed child (about 2.5%) is shown by the dotted line. The much greater risk of a malformed child after maternal rubella during the first 16 weeks of pregnancy is within the shaded area but is not known exactly.

The 1940 Epidemic

The first cases of this "rubella syndrome" described in Australia all followed maternal rubella in the epidemic of 1940. In my own four cases of Fallot's tetralogy following maternal rubella, seen in 1947–9, I was interested to find that two of them were born towards the end of 1940 as the result of the same epidemic (PO37 born on October 18 and PO45 on October 13). In London this epidemic was of high virulence and unusually prone to attack adults—a fact of which I have personal memory because of the difficulty in finding accommodation for the nurses and soldiers with rubella who were admitted to the war hospital where I was working. Even more striking, Stuckey (1956) found that 16 of his 27 patients had been born in 1940. He was able to calculate that the incidence of persistent ductus in children born to mothers who had suffered from rubella during pregnancy in New South Wales during 1940 was 88 times as high as normal, and the incidence of several other heart malformations about 11 times as high.

In my opinion, the rubella epidemic of 1940 in Australia and in England, and probably elsewhere, was unusually potent in producing these cardiac and other malformations. Since then the danger of maternal rubella producing these malformations seems to have been less generally, but perhaps not in some epidemics, though its effects could have been lessened by therapeutic abortions.

2. Types of Congenital Heart Disease

This paper is concerned mainly with the cardiac malformations. Bell (1959) found these to occur alone in 50 cases, with cataract in 78, with deafness in 52, and with deafness and cataract in 30. Cataract alone was uncommon (7%) and deafness alone very common (40%), deafness and cataract combined without a defect of the heart being the least common of all groups (3%). This can be explained because cataract is most likely to follow early infection and deafness late infection, and malformations of the heart in between. Heart malformations alone or in combination occupy an intermediate position as regards frequency—alone (12%), with cataract (19%), with deafness (12%), and with deafness and cataract (7%): they are therefore present in half the cases. Those with combined defects are probably reported more often, and I think heart malformations occur alone more often than these figures would suggest.

Relatively few of the series have been reported by cardiologists, and often the diagnosis is of congenital heart disease without any details, so that we have less information about the types that occur most frequently. From the beginning (Gregg, 1941; Swan *et al.*, 1943) persistent ductus arteriosus was prominent among them and cyanotic heart disease was much less common. Gibson and Lewis (1952) could find little information about the types of heart malformation, but had 17 examples among their patients—11 with persistent

ductus alone, 3 with this and some other malformation, and only 3 with any other cardiac malformation alone. Stuckey (1956) also, both in his own cases and in the reported cases that he collected, found that persistent ductus was much the most frequent, and this is also the case in the series of Julia Bell (1959, and personal communication).

The malformations found in these two series and a few other cases that I have collected are shown in Table III. There were 136 cases with 153 cardiac malformations, as 17 had two. Persistent ductus was much the most common malformation, being the only one present in more than half the cases (74 out of the 136 and another 15 where it was combined with a second cardiac defect—that is, 58% of the 153 malformations). Ventricular septal defect (17+10 cases) was the only other condition that occurred in as many as one-tenth of the cases (nearly 18%). Fallot's tetralogy (11 cases, 7%), atrial septal defect (10 cases, 6.6%), and pulmonary valvular stenosis (9 cases, 6%) were the next most frequent malformations.

TABLE III.—*Types of Congenital Heart Disease after Maternal Rubella*

	Alone	With P.D.A.	With V.S.D.	With P.V.S.	With Other	Total	Percentage
P.D.A.	74	—	9	4	2	89	58·1
V.S.D.	17	9	—	1	0	27	17·6
A.S.D.	9	0	0	0	1	10	6·6
P.V.S.	4	4	1	—	0	9	5·9
Fallot	10	0	0	0	1	11	7·2
Other*	5	2	0	0	0	7	4·6
Total	119	15	10	5	4	153	100·0

* Coarctation 4 (2 with P.D.A.); aortic stenosis 1; transposition 1; tricuspid atresia 1.
17 cases are included twice, as they had two malformations.

It is particularly striking that the combination of persistent ductus and ventricular septal defect should have occurred in 9 cases (6%)—nearly as often as any malformation except these two separately—for in general it is not a very common association. This relative distribution of the different forms of congenital heart disease is totally unlike anything that is found elsewhere, and helps to justify the use of such a term as the "rubella syndrome."

3. Proportion of Cases of Congenital Heart Disease Due to Maternal Rubella

No one has claimed that maternal rubella is responsible for a very large proportion of cases of congenital heart disease. Three of the highest estimates I have seen are the following: Conte *et al.* (1945) found an incidence of 4%; Mouquin *et al.* (1956) thought it might be as high as 6% but that there were genetic causes for the great majority of cases; and Keith *et al.* (1958) found 8 examples in 100 cases of persistent ductus. It may appear that Stuckey (1956) found an incidence of 10%, for there were 44 examples among 426 cases of congenital heart disease; but 21 of these had been referred specially because of the history of maternal rubella and 17 of the 44 had innocent systolic murmurs only: the percentage therefore cannot have been more than 5.4, and more likely was only 3.3 if the innocent murmurs were distributed at random.

Most estimates are much lower than these. Gibson and Lewis (1952) thought that maternal rubella was the cause in 1.2% of 1,366 patients. Lamy *et al.* (1957) also found an incidence of 1.2% of 1,200 cases of congenital heart disease, and it was highest among cases of persistent ductus (3.7%). My own experience is that maternal rubella is responsible for less than 2% of the cases.

Among 250 children with Fallot's tetralogy there were 4 (1.6%) with a history of maternal rubella. Though the percentage for Fallot's tetralogy was low, it might be much higher for persistent ductus, considering the pre-eminence of this in most series. Though Keith's 8 examples in 100 cases have been mentioned, our experience does not support this. Among 261 patients with a persistent ductus, where we made detailed inquiries about the families and the other malformations, there were only 5 examples (1.9%) (Polani and Campbell, 1960).

The relatively low incidence in 500 cases made us less thorough in trying to get a history of maternal rubella subsequently; and in the questionaries sent out to get fuller details about the families of our patients no specific question about this was asked. We have only three positive histories of maternal rubella in 151 patients with coarctation, 36 with tricuspid atresia, and 126 with simple pulmonary stenosis, and none in 156 patients with atrial septal defect and 71 with ventricular septal defect.

The estimates of various workers vary between 1.2 and 6 or even 8%, but we think it most unlikely that it is more than 3 or 4% at the most. At the recent International Congress on Congenital Malformations in London (July, 1960) the view was expressed that less than 10% of *all* congenital malformations were caused by maternal rubella and *all* viral infections.

4. Importance of Other Viral Infections

The discovery of the role of maternal rubella in causing congenital malformations was important not only in itself but because it suggested that some other infections might be equally important. If so, these infections are elusive, for they have been searched for by many workers, without any of them being able to produce convincing evidence or indeed much more than isolated cases. Grönvall and Selander (1948) thought one of their cases was due to maternal mumps; Landtman (1948) thought one was due to maternal influenza; and I have seen three where a viral disease seemed the probable cause (one due to maternal measles, one to maternal herpes zoster, and one to maternal vaccination during pregnancy). No one, however, has produced a striking series of cases, though it did not take long for Gregg's observations about maternal rubella to be confirmed in most parts of the world. It is possible that these isolated cases are no more than chance findings.

The work of Tondury (1953) is more decisive in proving the possibility. Examining the lenses of four foetuses whose mothers had been attacked by viral diseases in the early months of their pregnancies—one by epidemic parotitis, one by epidemic hepatitis, and two by poliomyelitis—he found changes similar to but not identical with those he had found after maternal rubella. Later, examining more foetuses after maternal poliomyelitis, he found necrosis and vacuolation in the cells of the brain and of the spinal cord. The disease had, of course, caused an abortion in these cases, but lesser changes could probably cause malformations in foetuses that were able to survive.

Among the carefully planned prospective studies on this aspect Hill *et al.* (1958) found no evidence that

maternal measles, mumps, or chicken-pox had any deleterious effect on the children, except that after chicken-pox an unusual number had a light birth-weight: they did not exclude the possibility that the number of abortions might have been increased by these infections.

The inquiry of Manson *et al.* about the effects of maternal rubella covered also 103 pregnancies where the mother had measles, 298 where she had chicken-pox, 501 where she had mumps, and 166 where she had virus influenza during the epidemic of 1950–1. *Measles*, even during the first 12 weeks of the pregnancy, had little effect on the number of abortions or stillbirths, but the number of infants dying during the first two years was more than six times as great as in the controls when the measles was in the first trimester. The proportion of dead infants with malformations was higher also—50% instead of 34%—but this was not enough to account for all the excess mortality. The result was that for maternal measles during the first trimester the proportion of children still living at the age of 2 years was only 78% instead of 93%.

Of the children born alive 7% had major malformations compared with 2.3% in the controls, and this effect was not limited to the first trimester. The malformations were very variable—of the brain twice, of the heart twice, and once each of congenital dislocation of the hips, pyloric stenosis, and neoplasm. The mother's measles was in the 35th week of the pregnancy in the case of the child with C.D.H., corneal opacities, and severe talipes. Admittedly the numbers are small and might be due to chance, but the increased death rate in infancy after measles during the first trimester and the increased number of malformations after measles at any stage of pregnancy cannot be dismissed without further inquiries.

There was no evidence that *chicken-pox, mumps, or influenza* during any stage of pregnancy had any effect on the number of abortions or stillbirths or on the infant mortality or number of malformations.

The proportion of infants born after maternal rubella in the first trimester with a *low birth-weight* of 5½ lb. (2.5 kg.) or less (17.7%) was four times as large as among the controls (4.3%), and this excluded the children who were premature—that is, delivered before the 36th week. Half the children who died after maternal rubella or measles weighed 5½ lb. (2.5 kg.) or less, but only 4 out of 20 who died after maternal mumps or chicken-pox.

There were only 33 pregnancies complicated by maternal *poliomyelitis*—too few for statistical treatment. However, in the six pregnancies where the mother had poliomyelitis between the 9th and 12th weeks there were one abortion, two stillbirths, and one child who died at 7 days from hydrocephaly and spina bifida; there were only two children who lived longer than this.

Apart from these two important papers I have not found much statistical evidence about viral infections other than rubella. According to Rhodes (1960), there is good evidence that vaccinia has no effect in producing malformations in the foetus. Influenza as a cause of such malformations is supported by some Dublin statistics but denied by most American ones; and an investigation from Finland found that mumps might sometimes be important as a cause of congenital malformations.

Other Infections and Disturbances During Pregnancy

Lamy *et al.* (1957) found a history of some infection during early pregnancy in 5.5% of the mothers of children with congenital heart disease compared with 2.4% among their controls. Among the mothers of 250 of my children with morbus caeruleus (mostly Fallot's tetralogy) there were 24 who gave a history of some illness or disturbance during the first three months of the relevant pregnancy—4 of rubella, 14 of other illnesses, and 6 of threatened abortion (Campbell, 1949); the other illnesses included pneumonia and one example each of shingles (the only certain viral disease) and whooping-cough. Among 126 of my patients with pulmonary valvular stenosis there was a history of severe maternal measles in one (third month), of a severe electric shock in one (second month), of heavy bombing and anxiety in two (first and second months), of corpus luteum injections during the second and third months because of two previous miscarriages in one, and of very severe vomiting and of exceptional anxiety, both these throughout most of the pregnancy. It is difficult to assess the significance—if any—of these histories, but it would seem worth carrying out an inquiry on a large scale where the decision about the inclusion of reported accidents and infections was taken during the pregnancy, before it was known if the child was normal or malformed.

Malformations in General

To turn to this wider field, Pleydell (1960) thought that in Northamptonshire there was a connexion between maternal infections early in pregnancy and the births of children with anencephaly and other congenital malformations, including heart disease. His evidence was perhaps not conclusive, but it was sufficient to make further inquiries well worth while. There is some evidence from Scotland and from Dublin that Asian influenza in the first trimester may increase the incidence of anencephaly by 25%. Threefold variations in the incidence of some malformations from month to month in some statistics have suggested the importance of infections.

Diseases of animals caused by viruses are common, but so far few attempts have been made to discover if any of them are responsible for malformations. Vaccines against hog-cholera virus and the blue-tongue virus have, however, caused malformations among the offspring (Rhodes, 1960), so that care may need to be taken about using poliomyelitis vaccine during a pregnancy.

That other viral infections as well as rubella can cause some congenital malformations seems to be established. It is most unlikely that they cause any substantial amount of congenital heart disease. Further prospective investigations covering measles and even minor infections do, however, seem worth while making.

Summary and Conclusions

The risk of abortion and of malformations in the child after maternal rubella during the first 12 weeks of pregnancy is considerable, though it must still be expressed as lying between wide limits. It is between 30 and 70% during the first four weeks, between 25 and 55% during the second four weeks, between 20 and 40% during the third four weeks, and between 10 and 25% during the fourth four weeks; later than this there is no increased risk. Perhaps the lower figures are

nearer the true risk generally and the higher ones apply to particular epidemics.

Deafness is the greatest risk, then congenital heart disease, and then cataract: mental defect and microcephaly and several other malformations are lesser risks. All these may occur alone or quite often in combinations. Of the heart malformations persistent ductus is much the most common (58%); then comes ventricular septal defect (18%). In about 6% of these the two defects are combined, and in ordinary practice this is not a very common finding. Atrial septal defect, pulmonary valvular stenosis, and Fallot's tetralogy each occur in about 6% of cases. This distribution is quite unlike anything found under other conditions.

Numerically, maternal rubella during pregnancy is not one of the major causes of congenital heart disease, though it is one of the best-proved causes. It is responsible for something between 2 and 4% of all cases. At the Congress on Congenital Malformations in London in July, 1960, the proportion of *all these* caused by maternal rubella and *all* other viral infections was thought to be less than 10%.

Other viral infections, including mumps, measles, epidemic hepatitis, and poliomyelitis, can produce similar malformations. It seems unlikely that they often do so, though measles and even any minor infections during pregnancy need further investigation.

I am most grateful to Dr. Julia Bell for letting me have the details of the type of congenital heart disease in the reported cases she had collected.

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ENDOCARDIAL CUSHION DEFECTS

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The surgical implications involved in misdiagnosing an endocardial cushion defect as a simple patency of an ostium secundum may be very serious. This is because the former cannot always be corrected satisfactorily without the application of an extracorporeal circulation, whereas an ostium secundum can usually be closed in a shorter time with moderate hypothermia or by the use of an atrial well. It is therefore of great importance to be able to differentiate these two types of lesion with reasonable certainty pre-operatively, so that the surgeon may be enabled to select the appropriate technical methods to achieve repair with an open heart.

It is easy to make this differentiation in most cases on clinical and other grounds. However, there is a type of large ostium secundum, in which the lower margin of the defect may reach to within a few millimetres of the endocardial cushion area, which so closely resembles an endocardial cushion defect in all characteristics that we believe it to be virtually indistinguishable from the latter before cardiotomy. We have also encountered an endocardial cushion defect in which all the evidence pointed to a large ventricular septal defect with pulmonary hypertension. We think it will be useful to describe our experience with 10 proved cases of endocardial cushion defect and to compare them with the two cases of large ostium secundum which we incorrectly diagnosed as endocardial cushion defects before operation.

Our cases have all been seen in infancy or early childhood and have been fully investigated, with the exception of one infant who died at 2 months before cardiac catheterization was performed. The diagnosis in all has been verified by visual inspection at operation or necropsy.

Nature of the Endocardial Cushion Defect

The embryological failure which gives rise to the varying degrees of endocardial cushion defect is well known, and excellent descriptions are given by Kramer (1942), Wakai and Edwards (1956), and Campbell and Missen (1957). It is clear that failure of normal fusion of the dorsal and ventral endocardial cushions of the primitive atrio-ventricular canal can lead to a spectrum of lesions extending from persistence of the ostium primum with deformity of the atrio-ventricular valve cusps to the complete anomaly in which, the cushions having failed to approximate, there is a persistency of the atrio-ventricular canal with a functionally unilocular heart. Numerous variations of the complex have been described, and a review of these is given by Kiely *et al.* (1958) together with a tabulation of 14 possible combinations of the defects comprising the syndrome.

Ostium primum patency without atrio-ventricular valve deformity appears to be exceedingly rare, if it ever occurs. Wakai and Edwards (1958), in a recent review of 100 cases of endocardial cushion defect, could

find no authentic case. They excluded the case of Blount *et al.* (1956) as the published picture of the heart showed a defect too posterior in position to be, in their opinion, an ostium primum.

There is, unfortunately, a lack of uniformity in the nomenclature applied to these variants, and they have been described under such names as ostium primum defect, partial or complete persistence of the atrio-ventricular canal, atrio-ventricularis communis, and endocardial cushion defects. Since the septational and valvular defects stem from the basic disorder in growth and fusion of the endocardial cushions, it seems logical to us to apply the generic term "endocardial cushion defect" to all varieties of this syndrome as advocated by Campbell and Missen (1957) and developed by them from the usage of Watkins and Gross (1955). The subdivision of cases into three grades dependent on the extent of the abnormality is also a great help in clarifying description. Thus grade I includes cases of persistence of the ostium primum with splitting of the anterior cusp of the mitral valve, or the septal cusp of the tricuspid valve, or both; grade II cases with a persistent ostium primum, bifid atrio-ventricular valve cusps, and a high ventricular septal defect; and grade III those with persistence of the common atrio-ventricular canal.

Clinical Material

The 10 cases of endocardial cushion defect and two cases of large ostium secundum patency were found during a period of eight years (1952–9) in which a total of 248 new cases of congenital cardiovascular disease were investigated in the children's department at Westminster Hospital. Of these patients, 66 (over 25%) were under 1 year of age. In this series the incidence of endocardial cushion defects is 4%, but it cannot be inferred that the true incidence is so high, since our patients are a highly artificial selection with a predominance of incapacitated infants and young children. Keith *et al.* (1958) state that about 2% of all congenital heart anomalies in children up to 14 years are of this type. Bailey *et al.* (1954) and Watkins and Gross (1955) report a 10–15% incidence of endocardial cushion defect encountered during operations for atrial septal defects. Paul (1958) says that in his experience in Chicago "one endocardial cushion defect presents itself for each seven or eight ventricular septal defects."

Only two of our cases were mongols, although during the same period eight mongol children with congenital heart disease have been fully investigated. This, although admittedly a small number on which to place much emphasis, is at variance with some of the published experience; for example, Paul (1958) states that the mongol with congenital heart disease has a 30–50% possibility of having an endocardial cushion defect.

All the cases (10 endocardial cushion defects and two large ostium secundum patencies) presented in the first two years of life with symptoms indicative of a disabling heart lesion, with the exception of one child (Case 8) with a grade I cushion defect who was asymptomatic when successfully operated upon at 8 years (see Table I). In many of the children who survived infancy the symptoms have become less severe with the passage of time, a tendency noted by most observers in a high proportion of cases with a predominant left-to-right shunt. Three infants, however, died in the first year of life of heart failure (Case 1, 5 months; Case 2, 2 months; Case 9, 8 months). Another child (Case 4), after a life of 5½ years characterized by frequent severe respiratory illnesses and almost complete cessation of growth after 4 to 5 months of age, died of combined pneumonia and congestive heart failure. His clinical signs and electrocardiogram showed the sequential changes of mounting pulmonary hypertension. This child had a grade I defect, Case 2 a grade II defect, and Cases 1 and 9 grade III defects. Cases 2 and 9 also had patent ductuses.

The presenting symptoms are similar to those of any other severe intracardiac defect. No one physical sign is pathognomonic of this condition. A loud, rasping holosystolic murmur maximal in the lower left parasternal area, but widely conducted over the whole praecordium and radiating into the axilla, was heard in seven of the cases of endocardial cushion defect and in both the cases of large ostium secundum patency. In many the murmur was accompanied by a thrill. It is extremely difficult, in our experience, to differentiate this murmur from that heard in many cases of ventricular septal defect, especially when it is present with a thrill. A low-pitched mid-diastolic murmur heard at, or just internal to, the apex was noted in five cases of endocardial cushion defect and in both cases of ostium secundum patency. The finding of this murmur in the two latter makes it difficult certainly to ascribe its presence in endocardial cushion defects to deformity of the mitral valve. It may possibly be due to the large flow of blood through the atrial defect or to relative tricuspid stenosis consequent on the left-to-right atrial shunt, since these are features common to both types of cases. A representative phonocardiogram showing the apical diastolic murmur is presented in Fig. 1.

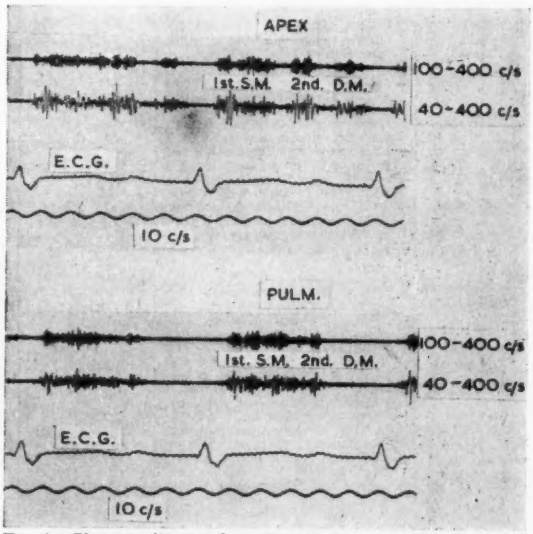


FIG. 1.—Phonocardiogram from Case 6 with a grade I endocardial cushion defect showing the mid-diastolic apical murmur.

Chest Radiography

This appears to be of little value in discriminating between endocardial cushion defects and other lesions with free communication between the left and right heart chambers and a predominant left-to-right blood shunt. Both the cases with a large low-sited ostium secundum showed no distinguishing features from the

TABLE I.—*Clinical Details*

Case No.	Date of Birth	Infantile History	Major Symptoms	Cardiovascular Signs	Nature of Defect	Subsequent Progress
1	24/9/57	Full-term, normal pregnancy. Normal delivery. Birth weight 7 lb. 11 oz. (3,485 g.). Well until 6 weeks, when admitted to hospital with pneumonia. Congenital heart disease diagnosed. Transferred Westminster Hospital 2/12/57. Recurrent cyanotic attacks. Treated with digoxin and oxygen	Loss of weight. Breathlessness. Cyanotic attacks	Very large heart. Apex beat in 6th left intercostal space in anterior axillary line. Soft blowing systolic murmur maximal in pulmonary area	E.C.D. Grade III	Cardiac catheterization and selective angiocardiography 2/1/58. Died in congestive heart failure 1/2/58
2	25/3/56	Full-term, normal pregnancy. Normal delivery. Birth weight 7 lb. 10 oz. (3,460 g.). Occasional vomiting until 5 weeks, when cyanosis sometimes noticed with vomiting. Poor weight gain. By 8 weeks was severely cyanosed when vomiting. Admitted Westminster Hospital 18/5/56. Treated with digoxin and oxygen	Vomiting. Occasional cyanosis. Poor weight gain	Apex beat in 6th left intercostal space in anterior axillary line. Loud, rasping holosystolic murmur maximal in lower left parasternal area	E.C.D. Grade II. Patent ductus	Died in acute heart failure on 29/5/56
3	9/2/54	Full-term, normal pregnancy. Normal delivery. Birth weight 8 lb. 12 oz. (3,970 g.). Slow weight gain. Pertussis at 7 months. No weight gain after 2 years. Congenital heart disease diagnosed at 2½ years. Admitted Westminster Hospital 7/4/57. Weight 24 lb. (10·9 kg.)	Failure to thrive	Apex beat in 5th left intercostal space in anterior axillary line. Harsh holosystolic murmur over whole praecordium, maximal in lower left parasternal area. Inconstant apical diastolic murmur	E.C.D. Grade II	Cardiac catheterization and selective angiocardiography 9/4/57. Cardiotomy on 1/5/57 using Lillehei–deWall type pump oxygenator. Died of irreversible ventricular fibrillation after repair of ostium primum and cleft mitral leaflet
4	28/6/52	Full-term, normal pregnancy. Normal delivery. Birth weight 6 lb. 4 oz. (2,835 g.). Poor weight gain from birth. First admitted Westminster Hospital October, 1952, with pneumonia. Congenital heart disease diagnosed. Numerous subsequent admissions with chest infections and heart failure. Also in hospital elsewhere during infancy with severe gastroenteritis	Failure to thrive. Recurrent chest infections	Aged 4½. Apex beat in 6th left intercostal space in anterior axillary line. Tapping impulse. Parasternal systolic thrill. Loud, rasping holosystolic murmur over whole praecordium, maximal in lower left parasternal area. Apical diastolic murmur. Pigeon chest	E.C.D. Grade I	Died in January, 1958, of heart failure precipitated by pneumonia. Weight at death 23½ lb. (10·7 kg.)
5	17/12/57	Full-term, normal pregnancy. Normal delivery. Birth weight 7 lb. 4 oz. (3,290 g.). Mongol. Rapid breathing from birth with very poor weight gain. First admission to Westminster Hospital 11/8/58	Slow weight gain. Rapid breathing. Mongolism	Puny mongol infant. Apex beat in 5th left intercostal space in mid-clavicular line. Forceful impulse. Soft apical systolic and diastolic murmurs	E.C.D. Grade II	Fully investigated in August, 1958. Readmitted December and cardiotomy performed 15/1/59 under profound hypothermia (Drew's technique). Defects repaired but infant died 2½ hours post-operatively of heart-block
6	3/7/52	Full-term, normal pregnancy. Normal delivery. Birth weight 6 lb. 2 oz. (2,780 g.). Poor weight gain from birth. At 17 months admitted to hospital with bronchopneumonia. Congenital heart disease diagnosed. Frequent recurrent chest infections until operation in 1959. In congestive heart failure once at 5	Failure to thrive. Recurrent severe chest infections	Aged 7. Apex beat in 5th left intercostal space in anterior axillary line. Diffuse impulse. Systolic thrill with rasping holosystolic murmur, maximal in lower left parasternal area. Short apical diastolic murmur	E.C.D. Grade I	Fully investigated in 1958. Cardiotomy performed 17/9/59 under profound hypothermia (Drew's technique). Ostium primum closed and clefts in mitral and tricuspid valve leaflets repaired. Excellent post-operative progress
7	25/11/56	8 weeks premature. Breech presentation. Caesarean section. Birth weight 4½ lb. (2,040 g.). In incubator for several weeks. Congenital heart disease diagnosed soon after birth. Breathless and failed to thrive until operation in 1959	Failure to thrive. Dyspnoea	Aged 1. Apex beat diffuse. Loud, rasping holosystolic murmur maximal in lower left parasternal area	E.C.D. Grade I	Fully investigated in 1957. Defects successfully repaired in July, 1959, under profound hypothermia (Drew's technique). Now well and putting on weight
8	23/8/51	Full-term, normal pregnancy. Normal delivery. Birth weight 7 lb. 13 oz. (3,545 g.) Normal progress. Heart murmur first heard at routine school examination	None	Aged 7. Apex beat in 5th left intercostal space in anterior axillary line. Blowing holosystolic murmur, maximal in pulmonary and mitral areas. P II widely split. Short early apical diastolic murmur	E.C.D. Grade I	Fully investigated in 1958. Successful repair of defects 8/2/60 under profound hypothermia (Drew's technique)
9	20/9/58	Full-term, normal pregnancy. Forceps delivery. Birth weight 7 lb. 11 oz. (3,485 g.). Mongol. Blue at birth but then well till 4 months, when he weighed 13 lb. 7 oz. (6,095 g.). Subsequently lost weight and was admitted to hospital, where congenital heart disease was diagnosed. Admitted Westminster Hospital 27/4/59	Failure to thrive. Mongolism	Apex beat in 5th left intercostal space in anterior axillary line. Systolic thrill and loud rasping holosystolic murmur maximal in lower left parasternal area. Machinery murmur in Gibson's area	E.C.D. Grade III Patent ductus	Fully investigated during admission to Westminster Hospital. Died 3 weeks after discharge home in London Hospital of bronchopneumonia and heart failure
10	10/9/59	Full-term, normal pregnancy. Normal delivery. Birth weight 8 lb. (3,630 g.). Laboured breathing from second day. Congenital heart disease diagnosed at 3 weeks and digitalized. Poor weight gain. Admitted Westminster Hospital 24/11/59 with pneumonia and heart failure	Poor weight gain. Laboured breathing. Severe chest infection. Heart failure	Apex beat in 5th left intercostal space in mid-axillary line. Systolic thrill and loud, rasping holosystolic murmur, maximal in lower left parasternal area. Crepitations at bases	E.C.D. Grade II	Investigations interpreted as showing a ventricular septal defect with severe pulmonary hypertension. Died 24 hours after operation of pulmonary arterial banding, 2/1/60
11	26/8/56	Full-term, normal pregnancy. Normal delivery. Birth weight 7 lb. 13 oz. (3,545 g.). From 6 months had recurrent coughs and respiratory illnesses. Easy tiring on walking and often squatted. Breathless on exertion	Easy tiring. Breathlessness. Squatting. Recurrent respiratory illnesses	Aged 2. Apex beat in 5th left intercostal space in anterior axillary line. Harsh systolic murmur, maximal in lower left parasternal area. P II widely split. Apical diastolic murmur	Large ostium secundum	All investigations characteristic of E.C.D. Cardiotomy performed 24/9/59 under profound hypothermia (Drew's technique). Large secundum patency closed. Died 10 hours post-operatively of acute right heart failure
12	17/12/56	Illegitimate. No details of birth available. Admitted first to Westminster Hospital 1/2/57. Congenital heart disease diagnosed. Subsequently in Queen Elizabeth Hospital for Children, Banstead, and Westminster Hospital until operation in December, 1959. Progressed reasonably well. Weight at 3 years 28 lb. (12·7 kg.)	Poor feeder in early infancy	Aged 3. Apex beat in 5th left intercostal space just outside mid-clavicular line. Systolic thrill and rasping holosystolic murmur, maximal in lower left parasternal area. Apical diastolic murmur. P II normally split	Large ostium secundum with inferior edge close to fused endocardial cushions	Investigations characteristic of E.C.D. Cardiotomy on 17/12/59 under profound hypothermia (Drew's technique). Defect successfully closed. Post-operative condition excellent

other cases and were, in fact, considered radiologically compatible with the mistaken diagnosis of endocardial cushion defect. The *x*-ray findings are of moderate or considerable enlargement of all heart chambers, with fullness of the pulmonary artery and pulmonary plethora. Where there is significant pulmonary hypertension with a raised pulmonary resistance the characteristic clearing of the periphery of the lung fields is observed (see Figs. 2–4).

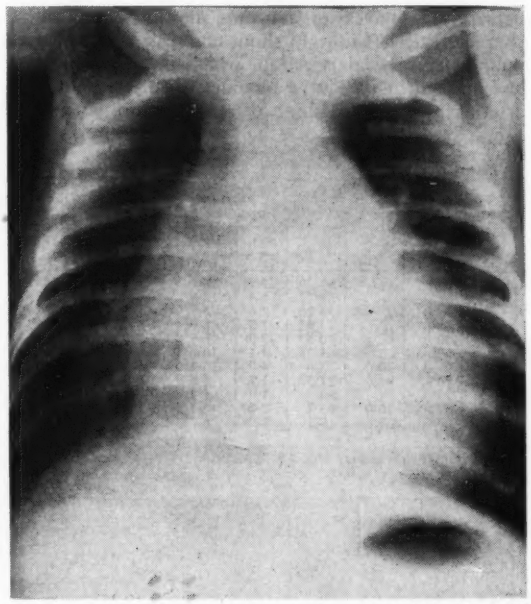


FIG. 2.—Chest radiograph of Case 1 with a Grade III endocardial cushion defect showing generalized cardiac enlargement with fullness of the pulmonary artery.

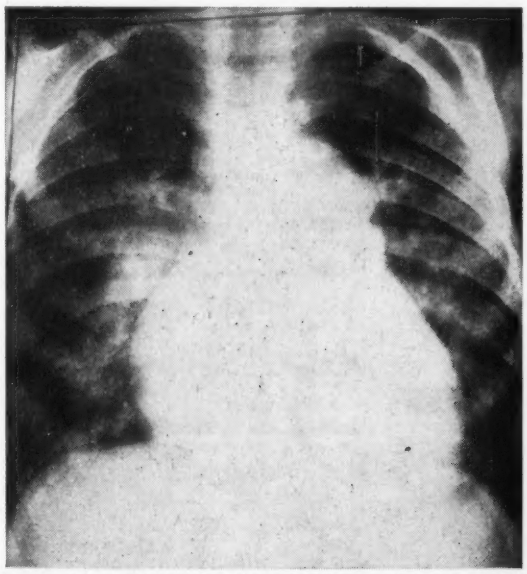


FIG. 3.—Chest radiograph of Case 4 with a grade I endocardial cushion defect and severe pulmonary hypertension. It was taken a few months before death at 5½ years. The patient had suffered from frequent severe respiratory infections. There is biventricular enlargement and gross enlargement of the right atrium and pulmonary artery with pulmonary plethora. The peripheral lung fields are relatively oligaemic.

Electrocardiography

We are in agreement with Toscano-Barbosa *et al.* (1956) in believing that cases of endocardial cushion defect show a highly characteristic electrocardiographic pattern, and have encountered no proved case without it. The features are: (1) in the standard leads—left axis deviation; (2) in the chest leads—right or combined ventricular hypertrophy patterns; (3) in the unipolar limb leads—a mainly negative QRS deflection in aVF, positive in aVL, and a large or small Q wave with a prolonged, often large, R wave in aVR. These features can be seen in the electrocardiograms of all our patients, including those with large low secundum defects (Figs. 5–16).

Reconstruction of the QRS frontal plane vectorial loop shows, in nearly all the cases, a pattern of a mainly anticlockwise loop lying for the most part above the iso-electric point (Fig. 17). This course is the opposite of that usually described in cases of ostium secundum atrial defects.

Certain circumstances may produce modifications in the cardiographic and vectorial patterns. The most important of these is the progressive development of pulmonary hypertension. Fig. 18 shows the changes brought about by mounting pulmonary hypertension in a boy (Case 4) who was observed from early infancy to death in congestive heart failure at 5½ years of age. The left-axis deviation in the standard leads was replaced by right-axis deviation, and the chest leads showed increasing evidence of right ventricular systolic overload. The QRS frontal vector loop inclined further and further to the right.

Cardiac Catheterization Studies

The low course of the catheter in traversing an ostium primum is a useful observation during cardiac catheterization, as pointed out by Wakai *et al.* (1956), but does not exclude an ostium secundum with a low inferior margin.

Haemodynamic data obtained at catheterization in 11 patients (9 endocardial cushion defects and 2 large secundum defects) are shown in Table II. Most, but

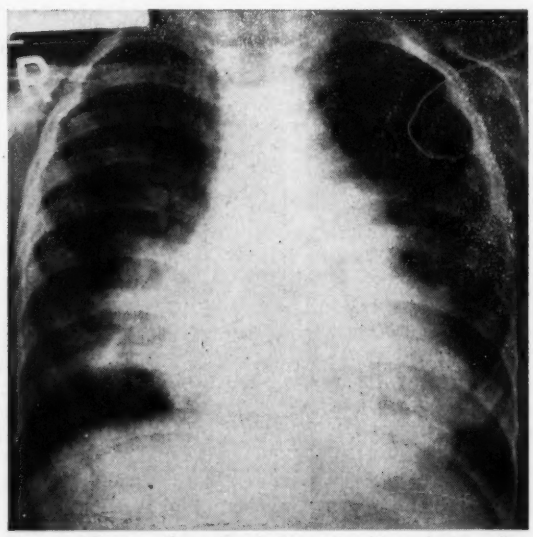


FIG. 4.—Chest radiograph of Case 11 with a large ostium secundum patency.

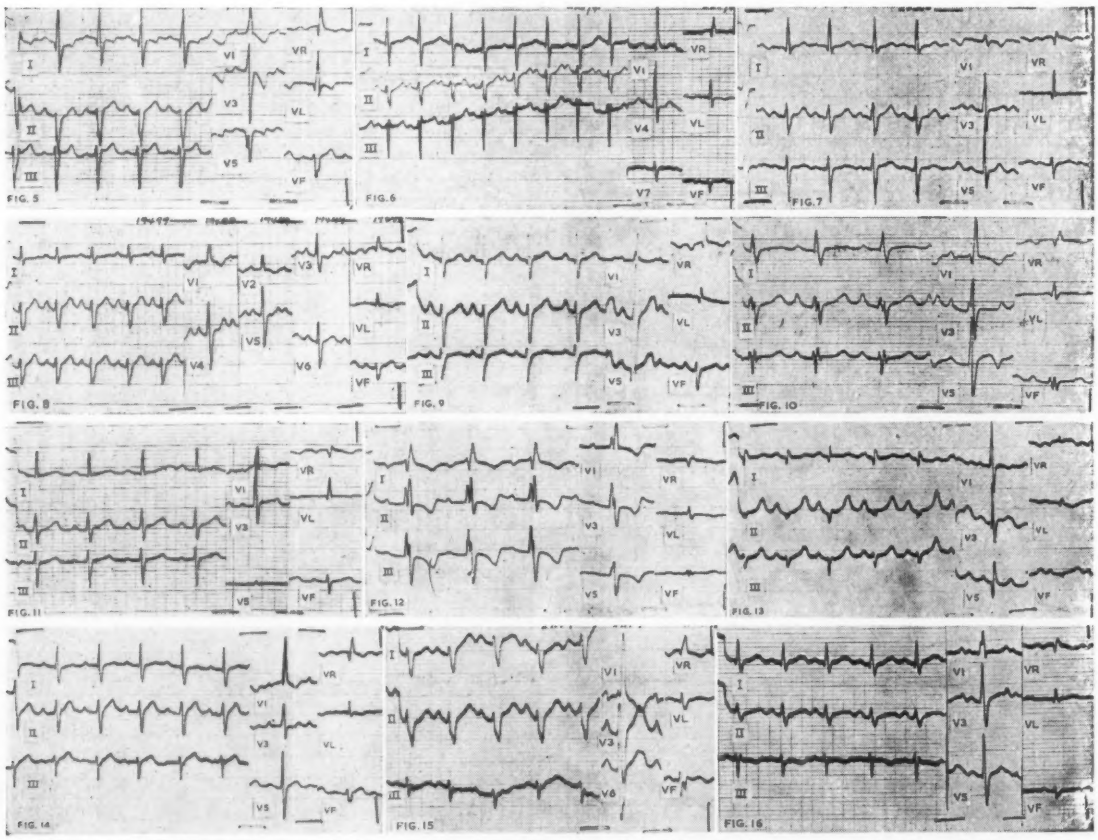
not all, cases showed significant arterialization in the right atrium, and, where this was not demonstrated, arterialization at ventricular level was apparent (Cases 9 and 10). In five cases increments of arterialization were found at atrial and ventricular levels. In all except Cases 7, 10, and 12 there was some degree of systemic arterial desaturation. In Case 7 an arterial oxygen saturation was not determined.

Indicator dilution curves were obtained in several cases at catheterization. We have used a Stanley Cox ear oximeter, Cambridge Instrument Co.'s amplifier, and an Evershed recorder, with methylene blue as the indicator substance in individual injection doses of 15–25 mg., since multiple injections are safe with this rapidly excreted material and we have been interested only in the configuration of the dye curves. Where possible, curves have been obtained from sequential injections into the two main pulmonary arterial branches. Differentiation of ostium secundum from ostium primum defects by this method has been fully discussed by Wakai *et al.* (1956), who have shown that in most cases of persistency of the ostium secundum there is a preferential left-to-right shunt of right pulmonary venous blood because the orifices of the right pulmonary veins are in close proximity to the septal defect. This gives an indicator dilution curve with a characteristic left-to-right shunt configuration with right pulmonary arterial injection, which is absent or much less marked in the curve obtained with left pulmonary arterial injection. With an ostium primum patency this

TABLE II.—*Cardiac Catheterization Data*

Case No.	Age	Percentage Oxygen Saturations						Pressures in mm. Hg					Flow in Litres/Minute		Shunts in l./min.		Peripheral Pulm. Resistance Dynes/Sec./cm.$^{-5}$
		Mixed Venous	R.A.	R.V.	P.A.	Systemic Arterial	P.V.	R.A.	L.A.	R.V.	L.V.	P.A.	Systemic	Pulmonary	L.-R.	R.-L.	
1	6 weeks	62	90	92	89	94	94	Mean 6	Mean 7	57/–5		60/30	1·5	10·0	8·5		319
3	3 years	72	83	84	85	91		,, 9		38/0		32/12	3·4	12·5	9·1		141
4	4 ,,	61	71	77	76	86	89	,, 1	,, 2·5	62/0		56/25	2·4	5·7	3·6	0·3	575
5	7 months	53	77	85		93	95	,, 7·5	,, 7·5	88/0		83/43	1·0	5·0	4·1	0·1	930
6	5 years	65	77	82	83	91		,, 0		50/0		50/5	3·3	10·8	7·5		163
7	13 months	79	85	88	82			,, 1·25		72/–5		68/35	4·1*	10·0	6·1		353
8	7 years	69	84	89	88	93		,, 2	,, 2·5	33/0	90/0	32/6	4·0	12·5	8·5		115
9	7 months	58	58	73	76	85		,, 0		70/–5	83/0	74/30	1·9	5·8	4·4†	0·5	687
10	3 ,,	48	47	66	67	95		,, 7		75/0		80/35	1·0	1·7	0·7		2,854
11	2 years	62	80	82	80	93	93	,, 12	,, 15	63/0	90/0	55/7	2·0	5·7	3·7		450
12	3 ,,	76	80	87	86	96	97	,, 0	,, 1	24/0	95/0	20/10	3·0	6·7	3·7		131

* Assuming systemic arterial blood 95% saturated with oxygen. † Assuming pulmonary venous blood 95% saturated with oxygen.



FIGS. 5–16.—Electrocardiograms of the 10 cases of endocardial cushion defect and two cases of ostium secundum patency.

preferential shunting does not occur, since the orifices of all the pulmonary veins are distant from the defect; thus curves from right and left pulmonary arterial injections are similar in form and both show a left-to-right shunt pattern. We have obtained similar curves in one of our cases of large ostium secundum patency where the lower edge of the defect reached almost to the fused endocardial cushions.

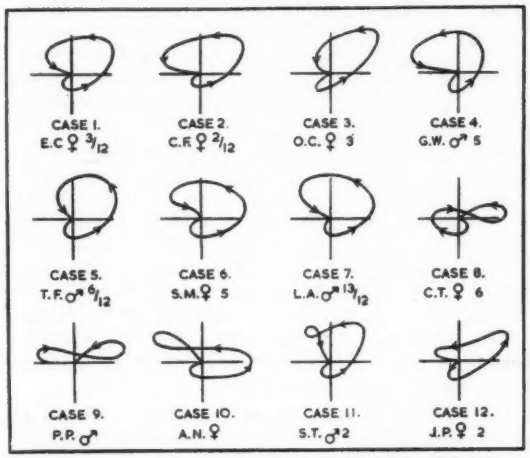


FIG. 17.—Reconstructed frontal plane QRS vectorial loops.

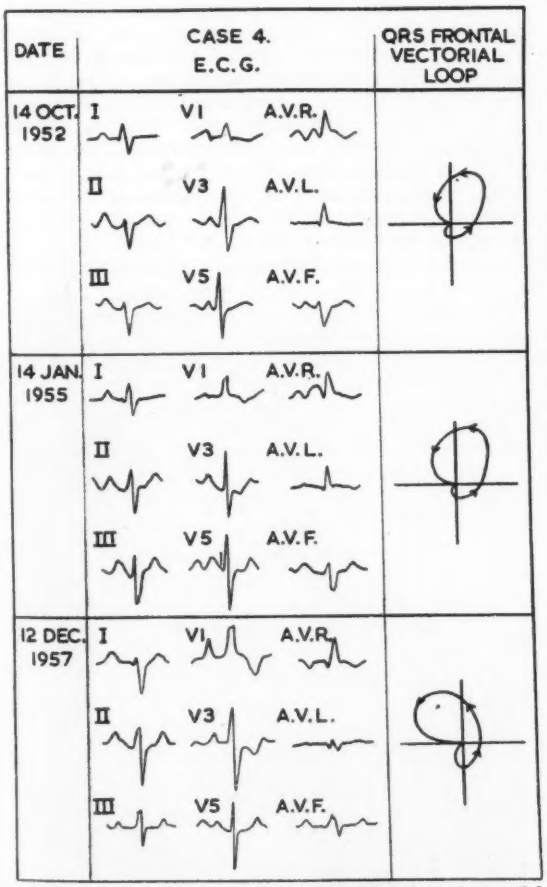


FIG. 18.—Serial electrocardiograms and QRS frontal vectorial loops of Case 4 showing the sequential changes of increasing pulmonary hypertension.

Angiocardiography

Selective angiocardiography was performed on six of the cases of endocardial cushion defect (Cases 1, 3, 4, 7, 9, and 10). Case 9 had two examinations with injection of contrast medium into the left and right ventricles. The investigation was also performed on one of the two cases of large ostium secundum patency (Case 12).

In this total of eight examinations the catheter tip was placed in the right ventricular outflow tract in six instances (Cases 1, 3, 7, 9, 10, and 12), in the right atrium in Case 4, and in the left ventricle (via a ventricular septal defect) in Case 9.

With the exception of Case 7, with a grade I cushion defect, and Case 12, where there was a simple but large ostium secundum patency, all the cases examined with ventricular injection of contrast medium had an interventricular communication and showed simultaneous filling of all heart chambers almost immediately after commencement of the injection. In Case 7, on opacification of the left heart chambers, no opacification of the right atrium or re-opacification of the right ventricle could be detected, although marked re-opacification of the pulmonary arterial tree occurred.

The angiocardiogram in Case 12 demonstrated the atrial communication with passage of contrast medium from the left to the right atrium and subsequent continuing opacification of all the heart chambers throughout the remainder of the study.

In Case 4, where the injection was into the right atrium, there was immediate filling of the other three chambers, which continued through the examination. The right-heart chambers were very large and the lungs showed hypertensive changes with rapid tapering of the pulmonary arterial branches and paucity of opacification in the peripheral lung fields.

A finding in nearly all the cases of endocardial cushion defect to which we attach some diagnostic significance was intense prolonged opacification of an enlarged left atrium. In the lateral films of some of these cases it is possible to see the forceful but incomplete ejection of left atrial contents into the left ventricle during atrial systole and the reverse effect (ejection of left ventricular contents retrogradely through the mitral valve) during left ventricular systole. Owing to the large left-to-right shunt of blood in these cases a constant finding was smallness of the aorta.

Operative and Necropsy Findings

Five cases of endocardial cushion defect (Cases 3, 5, 6, 7, and 8) and both cases of large ostium secundum patency (Cases 11 and 12) were submitted to cardiotomy. After operation three of the former have survived and progressed well with loss of physical signs, as has one of the latter two cases.

Our first case undergoing operation (Case 3) was incorrectly diagnosed before the procedure as a ventricular septal defect with the probable addition of an ostium secundum patency. At operation on May 1, 1957, use was made of an extracorporeal circulation with a bubble oxygenator of Lillehei–DeWall type. The presence of a large right atrium on inspection at thoracotomy, reinforced with further blood-oxygen-saturation estimations, indicated that an interatrial

communication would be found. Right atriotomy was performed and a large ostium primum, with a cleft anterior leaflet of the mitral valve, was repaired. On reversing the potassium-induced heart arrest, however, irreversible ventricular fibrillation ensued. At necropsy, in addition to the defects already stated, there was a high ventricular septal defect (grade II endocardial cushion defect).

The four other cases of endocardial cushion defect and two of ostium secundum patency were operated upon, utilizing the technique devised by Drew (Drew *et al.*, 1959) of profound hypothermia with an extra-corporeal circulation and using the patient's lungs for oxygenation. The correctness of the diagnosis was verified in the cases of endocardial cushion defect, and satisfactory curative surgical procedures were performed. The first infant operated upon (Case 5) recovered consciousness and was well for two and a half hours but died suddenly of heart-block, as seen on the continuous E.C.G. recording. At necropsy no other satisfactory explanation of death could be found. Good repair of the defects had been achieved and the wounds were healthy and well repaired. The three subsequent operations have all been carried out with rapid post-operative recovery and the absence of any untoward complications. Clinically, the repairs seem to have been curative.

The two cases of ostium secundum patency were incorrectly diagnosed as having endocardial cushion defects. The first patient operated upon (Case II) died a few hours after closure of the chest wound. The child had a pulmonary resistance of 450 dynes/sec./cm.$^{-5}$ and death was attributed to acute right-heart failure. The action of the left ventricle after closure of the atrial defect and re-warming of the patient appeared satisfactory. The other child (Case 12) has made an excellent post-operative recovery and her cardiac signs have disappeared.

On January 1, 1960, we submitted to operation for pulmonary arterial banding a 3-months-old infant (Case 10) who was diagnosed, on catheterization evidence, as having a ventricular septal defect with gross pulmonary hypertension. Congestive heart failure had been treated with digitalis, oxygen therapy, and mercurial diuretics with relief. At thoracotomy the initial pulmonary arterial systolic pressure of 65 mm. Hg was reduced to 35 mm. by the application of a tape round the main pulmonary trunk. After a day of satisfactory recovery from the operation, the infant developed cardiac arrest, which responded to immediate cardiac massage in the ward, but she died an hour later of a second arrest which failed to respond to direct massage of the heart. At necropsy the infant was found to have an endocardial cushion defect of grade II type.

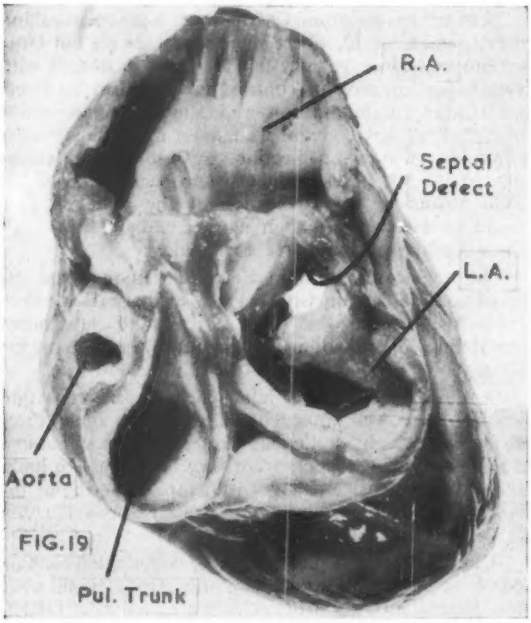


FIG. 19

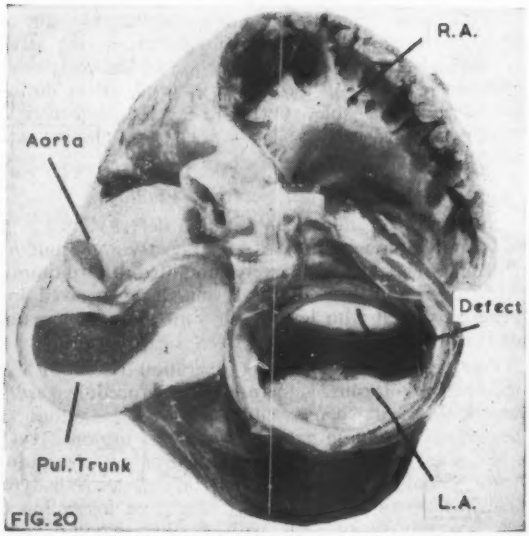


FIG. 20

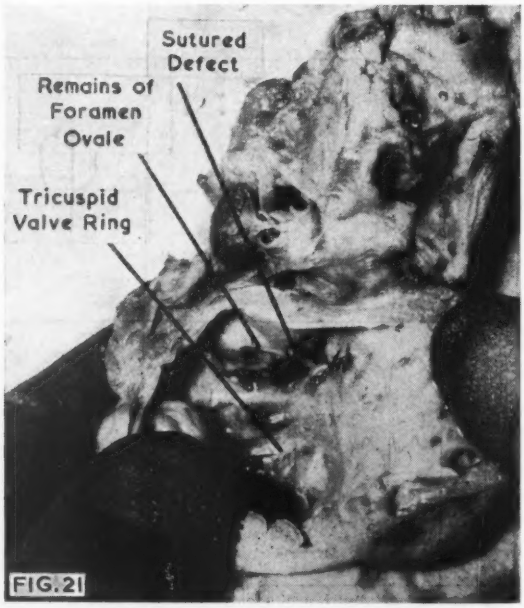


FIG. 21

FIGS. 19–21.—Photographs of necropsy specimens from two cases of endocardial cushion defect and one case of large ostium secundum patency. Fig. 19. Case 1, with a grade III endocardial cushion defect. Fig. 20. Case 4, with a grade I defect. Fig. 21. Case 11, with a large atrial defect of ostium secundum type. The defect has been surgically repaired.

Four of our patients with endocardial cushion defect have died in early infancy or childhood without the benefit of surgery. One infant (Case 2) succumbed at 2 months before detailed cardiac investigation could be carried out. She had a grade II defect with the addition of a patent ductus. The other three were all fully investigated and diagnosed before death: the first (Case 1) was 5 months at death and had a grade III defect; the second (Case 4) survived until 5½ years with a grade I defect, aggravated by frequent severe pneumonic illnesses; and the third (Case 9), a mongol, lived for 8 months and died shortly after admission to the London Hospital with pneumonia and congestive failure. We are indebted to Dr. A. D. M. Jackson for kindly allowing us to inspect the heart and confirm our previous diagnosis of endocardial cushion defect (grade III) with a patent ductus.

Photographs of the heart lesions in necropsy specimens of some of these cases are shown in Figs. 19–21. The grade of endocardial cushion defect in the 10 cases is shown in Table I.

Discussion

The rapidly increasing application of intracardiac operative techniques in the corrective treatment of congenital heart defects has resulted in the necessity for precise and accurate pre-operative diagnosis in this field. Surgeons, in order to carry out their procedures, utilize different methods for the open exposure of the heart, depending on the type of lesion they expect to find at operation. This is the case in the operative treatment of ostium secundum atrial defects and endocardial cushion defects. The former can usually be dealt with under moderate hypothermia or through an atrial well, whereas the latter generally need the application of an extracorporeal circulation with or without profound hypothermia.

Considerable attention in many centres, notably in the United States, has been given to this problem of differentiating ostium secundum atrial defects from the more complex endocardial cushion lesions and many diagnostic pointers have been described. There is certainly nothing in symptomatology to separate them apart from the common observation that, as a rule, ostium secundum defects do not produce significant symptoms during infancy and childhood in the majority of cases. In the eight years during which these cases have been observed we have encountered only two deaths in infants or young children due to a simple ostium secundum defect, while four patients with endocardial cushion defect have died (excluding the three post-operative deaths), three of them in the first year of life.

Even the extent of the particular lesion does not seem constantly to determine the severity of the symptoms except that grade III endocardial cushion defects produce early infantile disability and death. Our grade I cases have included a child who was symptomless up to successful operation at 8 years (Case 8) and a child who died at 5 years in congestive heart failure (Case 4). Pulmonary hypertension was present with typical histological changes of hypertension in the lung arterioles. From observations we have made on pulmonary hypertension complicating patent ductus (Anderson and Coles, 1955) and from the effect of pulmonary arterial banding in infants with ventricular septal defects, large pulmonary artery blood flow, and a high pulmonary systolic pressure, we attribute the hypertensive vascular changes found in the pulmonary arterioles of many cases of left-to-right-shunt defects in association with an elevated peripheral pulmonary resistance to the increased pulmonary blood flow. If we are right in this belief there is hope that in the severely affected infants early surgical correction may either prevent the development of these hypertensive changes in the pulmonary arterioles or lead to a reversal of those which are present. In this context it is highly significant that the lungs of Case 1, who had a grade III cushion defect and died at 5 months in heart failure, did not show hypertensive arteriolar changes.

Children with pulmonary plethora are particularly liable to recurrent chest infections, and these, if severe and frequent, may be extremely crippling and even fatal. Case 4 demonstrates well the adverse effects of an early attack of pneumonia. Although his weight gain from birth was slow, he otherwise appeared normal until 3 months, when he developed pneumonia. His birth weight was 6 lb. 4 oz. (2,835 g.) and weight at 3 months 8 lb. 11 oz. (3,940 g.). Subsequent to this he had repeated pneumonic illnesses, his growth was excessively slow, and at death at 5½ years he weighed 23½ lb. (10.7 kg.).

We have not found physical signs diagnostic in our cases. In many of them the systolic murmur suggested the presence of a ventricular septal defect, especially as it was often maximal in the lower left parasternal area and accompanied by a thrill. The association of an apical diastolic murmur is not infrequent in ventricular defects. This combination of murmurs was heard in five of the cases of endocardial cushion defect and in both cases of large secundum defects where there was no lesion of the mitral valve. It is possible that the diastolic murmur in all these cases results from the passage of blood across the atrial defect or from a torrential flow through the tricuspid valve (Wood, 1956).

Some degree of systemic arterial oxygen desaturation was found in nearly all cases at cardiac catheterization. We regard any saturation below 95% as indicating some degree of desaturation, and this has been confirmed by obtaining arterial saturations in excess of 96% in nearly all those cases we have catheterized in which we have found no shunts between the lesser and greater circulations and no pathological lesions in the lungs. It will be noted that in three of the five instances in which pulmonary venous blood was sampled the saturations were below 95%. A survey of the catheter findings in six cases of simple ostium secundum patency, 21 cases of ventricular septal defect, and nine cases of patent ductus have shown the following results:

Lesion	No. of Cases	No. Showing Arterial Desaturation
A.S.D.	6	5 (83%)
V.S.D.	21	12 (57%)
P.D.A.	9	6 (67%)

It is possible that oxygen desaturation of systemic arterial blood in cases of left-to-right shunt may be due to impaired gaseous interchange across the respiratory epithelium as a result of the increased pulmonary flow, or to the presence of a small but significant right-to-left shunt across the defect, or to the effects of basal narcosis or anaesthetic agents, or to varying combinations of these factors.

There does not appear to be any means of distinguishing certainly between an endocardial cushion

defect and a large low-lying ostium secundum patency, since catheterization data, the course of the catheter in traversing the defect between the atria, and indicator dilution curves obtained from both main pulmonary arterial branches are identical in the two conditions. At the present time, therefore, this type of ostium secundum defect will be diagnosed as an endocardial cushion defect, and operative treatment, if undertaken, will be carried out utilizing some form of extracorporeal circulation. Although this may increase the hazards of operation to individual patients with secundum defects which could have been closed under moderate hypothermia, it is far better that this small minority of cases should undergo an unnecessarily complicated operation than that cases of endocardial cushion defect should be found inoperable owing to the application of inadequate techniques giving the surgeon insufficient time to repair the malformations.

It seems probable that the cases which have been described in the past as ostium primum defects without atrio-ventricular valve involvement are really instances of the type of ostium secundum persistence which we have described in this paper. The deficiency in the interatrial wall is large, relatively posterior, and extends down to within a few millimetres of the fused endocardial cushions, and this latter feature gives it superficially the appearance of an ostium primum defect. The electrocardiograms of our two cases were similar to those found in endocardial cushion defects, and had characteristic frontal vectorial loops. McGoon *et al.* (1959) state that these findings may be observed in 3% of ostium secundum defects and in 13% of ventricular septal defects. We have found the same patterns in one case of patent ductus (Fig. 22). We are inclined to agree

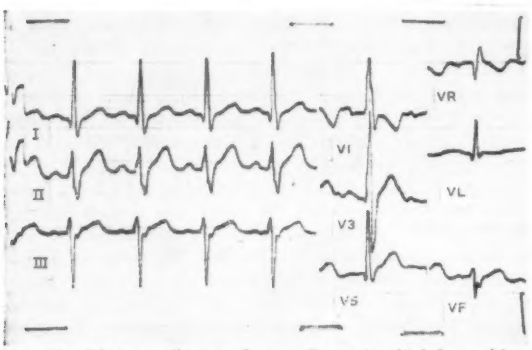


FIG. 22.—Electrocardiogram from a 7-months-old infant with a patent ductus, showing the similarity to the pattern characteristic of endocardial cushion defects.

with Toscano-Barbosa *et al.* (1956) from the Mayo Clinic that the cardiographic pattern probably reflects an abnormal conduction pathway due to the disordered anatomical relationships in the atrio-ventricular region in cases of endocardial cushion defect as well as in the cases of low-reaching ostium secundum patency. It is difficult, however, to see why a similar pattern should result from the usual type of atrial defect and from some ventricular septal defects and patent ductus. An anatomical abnormality of congenital origin cannot be regarded as likely in the atrio-ventricular region in all these cases, and it must therefore be assumed that the electrocardiographic changes are due to hypertrophy of parts of the heart muscle in response to the demands of the particular defect leading to alterations in the functional capacity of portions of the conduction pathway.

The mortality from endocardial cushion defects is high in infancy and early childhood. For this reason we feel it is desirable to consider early corrective surgery in this group of cases when they present with symptoms and signs of heart disablement. Vigorous medical treatment on orthodox lines should be instituted first and detailed investigation carried out whenever possible to exclude some other lesion mimicking an endocardial cushion defect. Although the risks of intracardiac operation in an infant are great, we believe that, with increased experience in this group of cases, the mortality will diminish to the level in older children.

Summary

An account is presented of the symptoms, physical signs, and haemodynamic data in 10 cases of endocardial cushion defect and two cases of large ostium secundum patency, in one of which the lower edge of the hole nearly reached the fused endocardial cushions. All the cases were seen in infancy or childhood and were fully investigated with the exception of one infant who died at 2 months.

At present there is no certain means of differentiating between an endocardial cushion defect and an ostium secundum of this particular type. Both have similar physical signs, electrocardiographic patterns, and catheterization findings, including a low course of the catheter through the atrial defect, and identical indicator dilution curves when the indicator substance is injected into the right and left pulmonary arteries.

The results of curative surgical operations on the patients so treated are described. Five cases of endocardial cushion defect were operated upon. The first child was incorrectly diagnosed before cardiotomy as a case of ventricular septal defect with a probable additional ostium secundum patency. Open heart surgery was effected in this case in May, 1957, using a bubble oxygenator of Lillehei–DeWall type, and the child did not survive the procedure. The four other cases were correctly diagnosed and submitted to cardiotomy, using the technique of Drew—namely, a combination of extracorporeal circulation and profound hypothermia. Three of these patients have survived and are clinically cured.

The two cases of ostium secundum patency were erroneously thought to have endocardial cushion defects, but at operation, using profound hypothermia, the true nature of the lesion was recognized and the defect appropriately repaired. The first patient operated on died from acute heart failure a few hours after closure of the chest; the second has done well and appears to be clinically cured.

Final diagnosis in all 12 cases has been made on visual inspection at operation or necropsy.

We thank Dr. Peter Kerley and Dr. Basil Strickland for many helpful discussions on the radiological and angiocardiographic features of these cases; Mr. C. E. Drew for the surgical treatment of the cases operated upon; Dr. A. D. Morgan and Dr. I. M. P. Dawson for the necropsy reports; Dr. P. Cliffe for instrumentation; and Dr. Peter Hansell for the photographic reproductions. We would also like to place on record our gratitude to Miss June Sherwood, sister of the children's ward, for her devoted care of the patients at all times.

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MANAGEMENT OF CASES OF ABORTION

BY

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This review is based on the work of the abortion unit at Walton Hospital, Liverpool, during the years 1958 and 1959, and the results achieved with a particular type of treatment in cases of abortion admitted to it.

Cases of abortion are usually admitted to a gynaecological ward, a system which is very inconvenient when large numbers are admitted annually. Among its disadvantages is the blocking of a variable number of beds, making the arrangements of clinic admissions difficult, and there is also the frequent use of an operating theatre at inconvenient times.

In January, 1950, at this hospital, a separate ward block with 40 beds was made available as an abortion unit. It is arranged in three floors, with an operating theatre on the first floor. Patients admitted with a diagnosis of abortion are taken to the abortion unit unless they require resuscitation in the admission room.

Criteria Used in Classification

An abortion was regarded as threatened if the cervix was closed and the bleeding slight. In inevitable abortion the cervix must be open with the products of conception protruding and felt digitally or seen by direct vision. No abortion was regarded as complete unless the intact ovum or the foetus followed by an intact placenta was seen by the hospital medical officer.

Difficulty often arose in differentiating between threatened, incomplete, and complete abortion. The amount of bleeding was not a reliable guide; in some cases the pregnancy continued after relatively heavy bleeding, while in others a slight loss of blood may have been followed by the unrecognized expulsion of an intact ovum. When comparison of the period of amenorrhoea with the size of the uterus, the state of the cervix, and examination of the vaginal discharge for fragments of ovum still left the diagnosis in doubt, the abortion was regarded as threatened. Biological pregnancy tests and a period of observation helped to establish the diagnosis later.

The criteria for the diagnosis of septic abortion were similar to those adopted by Stallworthy (1948)—namely, that an abortion was regarded as septic when associated with pyrexia for which no other cause was found, with offensive purulent discharge, or with evidence of pelvic infection.

Treatment

Cases are admitted to the ground-floor wards and a vaginal examination is made. If the abortion is inevitable the part of the ovum in the cervical canal is removed either digitally or, if this is impossible, with a pair of sponge forceps under direct vision. Ergometrine 1 mg. is given intramuscularly. Cases of incomplete abortion are also given ergometrine if there is any bleeding.

Each week, operating sessions are held on Tuesday, Thursday, and Saturday mornings. The day before operation all cases in which surgical evacuation of the uterus is to be performed are taken to the first-floor ward. They include all the incomplete abortions and any "complete" abortions where vaginal bleeding or discharge persists.

Morphine sulphate 1/6 gr. (11 mg.) and atropine sulphate 1/100 gr. (0.65 mg.) are given intramuscularly as premedication one hour before operation. Thiopentone alone is used in most cases, nitrous oxide and oxygen being used occasionally for supplementary maintenance of anaesthesia. Vulval toilet is carried out, using 1% cetrimide solution. Retained products of conception are removed digitally or by sponge forceps, and curettage is performed with a large, sharp curette. If bleeding is troublesome ergometrine 1 mg. is given intravenously. Packs are not left in the uterus and intrauterine douches are not used.

The patient is moved to the second floor on the day after operation, and if her progress is satisfactory she is discharged on the fourth day after operation.

This scheme of treatment has been in operation for nine years and the results have been very satisfactory.

The Investigation

It is estimated that about 15 to 20% of pregnancies terminate in abortion, and during the two-year period, January, 1958, to December, 1959, 2,387 patients were admitted to the abortion unit (Table I). The district from which these patients are drawn is a large overcrowded area adjacent to the docks of Liverpool. The general standard of health and hygiene is low and anaemia is common.

TABLE I.—*Admissions During* 1958 *and* 1959

Total no. of admissions	2,387
No. booked (at hospital antenatal clinic)	204
No. not booked	2,183
Average age	28·9 years
Primigravidae	24·8%
Unmarried	5·1%
Average maturity at onset of abortion	11·7 weeks
Less than 16 weeks' gestation	87%
Prophylactic rest (habitual abortions)	56
Hydatidiform moles	3
Ectopic gestation	1

The average age of the patients was 28.9 years, the youngest being 15 and the oldest 54. This corresponds with other series in the literature; in 2,665 cases quoted by Davis (1950) it was 29 years. As he points out,

this relatively high average age is due to the greater incidence of abortion in married women. The percentage of single patients varies according to the type of district and, as in the present series, is low in the working-class area with its low average age of marriage. The average maturity of 11.7 weeks at onset of the abortion agrees with Davis's figure of 12 weeks.

TABLE II.—*Type and Treatment of 2,327 Cases*

Diagnosis on Admission	No. of Cases Admitted	Completed Spontaneously	Completed Surgically	Pregnancy Continued
Threatened ..	643	27	149	467
Inevitable ..	195	14	181	
Incomplete ..	1,255		1,255	
Septic	149		149	
Missed	85		85	

Excluding prophylactic rest cases and miscellaneous ones.

In 62% of admissions the abortion was diagnosed as inevitable or incomplete, and nearly all of them had a surgical evacuation of the uterus. This figure is an indication of the "interventionist" type of treatment carried out in this unit. The 41 cases which aborted completely, not necessitating curettage, were mostly in the 24 to 28 weeks' period of gestation. In these the foetus and placenta were verified as being completely evacuated by a medical officer. We are in agreement with Safford and Longworth (1950), who made a special comment on the number of cases "ordinarily considered complete" which were, in reality, examples of incomplete abortion; retained chorionic villi being found in over 50% of all cases when the material removed from the uterus was later examined.

A diagnosis of threatened abortion was made in 643 patients, and 467 (72%) of these pregnancies continued. Treatment consisted of phenobarbitone alone, apart from bed rest. Although favourable results have been reported by Bishop (1951) and by Koff and Tulsky (1953) from the use of large doses of progesterone, the impression has been gained that the enthusiastic claims for the efficacy of progesterone, oestrogen, and vitamin E preparations in preserving pregnancy are not justified. Bevis (1951) had excellent results with rest and reassurance alone.

Colvin (1950), in a statistical study of the salvage possibilities in 1,570 consecutive cases of threatened abortion, states: "Mother nature efficiently copes with the problem of threatened abortion by preserving 69.9% of normal conceptions, and efficiently detects and successfully rids the uterus of 24.1% of pregnancies in which foetal development is defective."

The number of cases of prolonged intermittent painless bleeding during the middle trimester due to placenta praevia is impressive. Spontaneous expulsion occurs in many cases, but abdominal hysterotomy was resorted to in three cases owing to the severity of the bleeding.

For a long time there have been two schools of thought regarding the treatment of abortion once it has become inevitable or incomplete—the "interventionists" and the "non-interventionists." Series of cases have been published to show that one or the other is the safer method of treatment. Studdiford (1950) compared the two in a series of 4,129 patients and concluded that the results of the methods were not appreciably different. Nowadays the argument against intervention has lost its point, for the management of these patients has been revolutionized by the introduction of antibiotic drugs and an efficient blood transfusion service. These advances have greatly reduced the dangers of the two major causes of mortality in abortion—sepsis and haemorrhage.

Important from the point of view of hospital administration is the fact that for patients treated surgically the average length of stay in hospital has been much reduced.

In this unit, apart from the few cases where bleeding is so heavy as to require immediate operation, the time at which surgical intervention is practised varies according to the time at which the patient is admitted and the next operating day. It may be anything from about one hour to a maximum of three days. It is certainly more convenient and economical, where large numbers of patients are concerned, to have all the operations collected at three set sessions than to take each case individually to the theatre at any hour of the day or night.

Experience at this unit confirms that of Stallworthy (1948) and has shown that most cases bleeding heavily on admission have some part of the ovum lying in the cervical canal, and that, if the cervical canal is cleared at once and ergometrine given, the bleeding will cease. The patient may then be safely left as a case of incomplete abortion until the next operation list. It is rare for further bleeding to occur during this period. If a patient is bleeding severely on admission, and this treatment fails to arrest it, blood transfusion and oxytocics are followed by immediate surgical evacuation of the uterus.

The patient who has passed a foetus at 16–28 weeks' maturity and still has a placenta *in utero* often presents a problem. It has been our experience that an exploratory vaginal examination, with a finger introduced into the uterus, provoked heavy bleeding in so many cases that it has been banned. So long as the patient is not bleeding it is best to wait for the placenta to be expelled spontaneously. If there is any bleeding, or if the placenta is retained more than a few hours, the patient is taken to the theatre and a manual removal is carried out under anaesthesia.

TABLE III.—*Emergency Operations and Blood Transfusions*

Operations immediately after admission	27
Blood transfusions	270
Transfusions as emergency resuscitative measures	59
" for rapid treatment of anaemia	211

The number of operations performed immediately after admission was only 27 (Table III), and this is due largely to the practice of emptying the cervix in inevitable abortions. Blood transfusions were given in 11.6% of cases, and, of these, 22% were given as a resuscitation measure and 78% as a rapid treatment of anaemia. The value of blood transfusions is inestimable. A pint or two of blood is a relatively safe and more efficient method of correcting the anaemia and raising the general resistance to overcome infection than oral or parenteral iron therapy alone, which is meted out to patients almost as a routine during their stay in hospital and on discharge home. In a series of 600 cases Corston and Stallworthy (1947) gave 71 blood transfusions, an incidence of 11.8%.

The value of dextran and other plasma substitutes has perhaps been overrated. Scott (1955) has attributed coagulation failure to the effects of dextran administration. It is suggested that, quite apart from the factor of fibrinogen dilution by intravenous dextran, the fibrinogen may be precipitated as fibrin or inactivated

by forming a fibrinogen–dextran compound. We have had trouble after dextran infusion, and have now ceased to use it altogether. The risk of hepatitis with small-pool plasma is negligible, and the marked improvement in the shocked patient with its use will in most cases provide the time necessary to group the patient and cross-match a bottle of blood. Often the general condition has so improved that blood transfusion is not required.

Surgical Evacuation of the Uterus

The cervix is usually patulous, but if dilatation is necessary it is carried out with Hegar's dilators until a sponge forceps can be introduced. In this unit a large, sharp curette at least ½ in. (1.3 cm.) in diameter at its widest part is always used. A blunt curette needs quite heavy pressure to remove any but the least adherent tissue, whereas a sharp curette requires less pressure and is therefore safer than the blunt instruments. In the present series there were no cases of perforation of the uterus.

We in this unit agree with Purdie (1947) that intrauterine packs are unnecessary and dangerous. Packs do not always control bleeding, and when left in for several hours they encourage infection by preventing free drainage. Further, we have never found the necessity for warm intrauterine douches to control bleeding. Thorough evacuation of the uterus reduces the number of patients readmitted with menstrual disturbances or persistent bleeding.

TABLE IV.—*Septic Abortions*

Temperature 100° F. (37·8° C.) or over	149 (6·4%)
Gas-gangrene	1
Severe pelvic infection	11 (0·5%)

In the present series 6.4% of patients had at some time after admission a temperature of over 100° F. (37.8° C.) (Table IV). The incidence is rather low, as Burnett (1952) found an incidence of 11.5%, Studdiford (1950) reported 38%, and Bishop (1948) reported 17.3% as being septic in nature in their series. The discrepancy between these figures and ours is undoubtedly due to the prompt administration of antibiotics in suspected cases.

It is notoriously difficult to obtain reliable histories from patients suffering from septic abortion, and it is often suspected that criminal interference, which the patient will not acknowledge, has taken place. Davis (1950) thought that the great majority (perhaps 90%) of all abortions were induced in one way or another. The Inter-departmental Committee on Abortion (1939) came to the conclusion that 40% of the abortions in this country may be due to illegal interference.

Identification of the infecting organism has been possible in most cases, although even in clinically severe infection, surprisingly enough, no growth could be obtained from culture of high vaginal swabs. We agree with Burnett that owing to this lack of bacteriological aid empirical antibiotic treatment should be begun before the results of culture become available. We give a combination of penicillin and streptomycin therapy in full dosage in all cases until the culture report is available. The full course, usually of five days, is given, and the treatment is not allowed to lapse because the pyrexia has settled after the first day. The broad-spectrum antibiotics are kept in reserve for use after antibiotic-sensitivity tests have been carried out.

During the past nine years there were five cases of *Clostridium welchii* infection, all clinically typical, and three were proved bacteriologically. They were treated with full-dosage penicillin and anti-gas-gangrene serum, and four recovered. Dawbarn and Williams (1938) described three similar cases from this hospital; all were fatal. Comparison with the recent cases shows that the only difference in treatment was the use of antibiotics in the present series.

There were 11 cases of severe pelvic infection after abortion, an incidence of 0.5%. These were variously diagnosed as salpingitis, parametritis, and pelvic peritonitis. There were no cases of general peritonitis or pelvic abscess. They all responded to chemotherapy and all recovered. The incidence of similar infection in Davis's series was 4.6%, this being due to the series having extended for over 15 years and most of the cases having been treated before the antibiotic era.

The argument of active versus passive treatment of septic abortion has brought endless but inconclusive controversy. Taussig (1936) endorsed the view that expectant treatment was safer, but the more recent figures of Corston and Stallworthy (1947), Purdie (1947), and Studdiford (1950) indicate that immediate evacuation is apparently as safe. Our own experience confirms the latter finding. Although operative evacuation of an infected uterus is a delicate and highly dangerous procedure, the advantages are considerable. The infecting agent is removed, the abortion is properly completed, and the period of convalescence is materially shortened. Furthermore, the employment of intravenous ergometrine during the procedure has reduced the risk of perforation and of gross haemorrhage, and made evacuation so much the safer. Our contention is that the risk of generalized spread of the infection as a sequel to intervention is minimized by adopting the procedure of evacuation of the uterus after preliminary saturation of the blood with antibiotics. We hope that the results will justify our claim.

In over 90% of septic abortions there is no evidence of spread of infection beyond the uterus. Burnett (1952) showed that the surgical evacuation was best performed 24 hours after the temperature and pulse had returned to normal. We, however, have had no hesitation in carrying out curettage as soon as possible. This was carried out regardless of the infecting organism, provided the patient had received adequate antibiotic cover prior to the procedure for 24 to 36 hours after admission. When subsequent examination showed the development of a spreading infection, surgical evacuation of the uterus was deferred.

Excessive haemorrhage was regarded as the only reason for immediate operative intervention in the presence of pyrexia. Removal by sponge forceps or finger of loose products of conception protruding through the canal has enabled definitive evacuation under anaesthesia to be undertaken at a routine operating session after antibiotic therapy. Immediate transfusion has been found necessary in many of these patients.

In most cases the fever is due to an acute endometritis secondary to the presence of necrotic retained products, as in the vast majority of instances the temperature falls to normal within 24 hours after the operative completion of the abortion, while in a few this takes place gradually over a period of two to three days.

In the severe cases where the infection has spread beyond the uterus, except for removal of loose and easily

accessible products of conception in the cervical canal, surgical evacuation is postponed until the spreading process has been brought under control with antibiotic therapy. Fortunately, continued excessive blood loss is rarely encountered in such patients. When it is, immediate curettage is carried out by necessity.

Missed Abortion

Once a diagnosis of missed abortion is confirmed we favour active treatment. A policy of watchful expectancy has many disadvantages. In addition to the inconvenience and mental distress caused to the patient by waiting, the association of hypofibrinogenaemia with prolonged retention of a dead foetus *in utero* (Barry *et al.*, 1955; Quinn and Harper, 1955) would appear to be a strong argument in favour of active treatment.

Over the years we have used medical induction as suggested by Jeffcoate (1940), employing oestrogens followed by "pitocin," but have not been impressed with the results. Martin and Menzies (1955), in a critical re-evaluation of the role of oestrogen therapy, found it of very little value. We have therefore used intravenous pitocin drips in a concentration of 5 units per pint (570 ml.) of glucose solution, but have not been impressed by the reliability of this procedure. Loudon (1959) has described the treatment of missed abortion with pitocin intravenous drips in high concentration, and claimed good results. We, too, have since employed this method with success in five cases of missed abortion occurring after the fourteenth week of gestation, and endorse Loudon's claim that this technique offers a reliable, rapid, and safe method of managing missed abortion.

TABLE V.—*Stay in Hospital*

Average stay of patients with threatened abortion ..	15·1 days
" " " " completed abortion ..	6·9 "

Patients are discharged on the fourth day after operation. Corston and Stallworthy also discharged their patients at about the same time, and their average stay in 600 cases was 7.5 days. The figure for threatened abortions is raised in this unit owing to the increasing number of patients with habitual abortion being admitted for prophylactic rest. On the other hand, the average stay of patients with completed abortion has been reduced owing to the quicker turnover of the cases as they come in, coupled with energetic treatment of long-standing anaemia with blood transfusions.

Mortality

Since the inception of this unit five patients have died, giving a total abortion mortality rate of 0.06%. The mortality rates reported by various observers in recent years are shown in Table VI.

TABLE VI.—*Mortality Rates*

Author	Years	No. of Abortions	No. of Deaths	Mortality Rate
FitzGibbon (1947)	1919–26	1,952	6	0·31%
Davis (1950) ..	1935–50	2,665	6	0·26%
Ramsay (1948) ..	1937–46	1,430(septic)	47	3·29%
Stallworthy (1948)	1939–48	803	2	0·12%
Studdiford (1950)	1940–49	4,129	17	1·08%
Bishop (1948) ..	1942–47	2,317	10	0·43%
Purdie (1947) ..	1945	481	2	0·42%
Burnett (1952) ..	1946–50	2,322	4	0·09%
Walton series ..	1951–59	8,347	5	0·06%

The one death in the present series occurred as follows. The patient was admitted at the twentieth week of her pregnancy. Seven weeks later hysterotomy was carried out because of persistent blood loss. A placenta praevia was noted at operation, and death occurred from uncontrollable haemorrhage due to failure of coagulation. In retrospect, we feel that this death could have been averted if plasma and not dextran had been used.

Conclusion

The three aims in the management of abortion are to save as many pregnancies as possible, reduce mortality and morbidity, and shorten the stay in hospital. Although in recent years there has been a striking reduction in the number of women who died as a result of abortion, as shown by the Registrar-General's figures for England and Wales, yet deaths from abortion still rank third highest on the list of deaths from maternal causes (Ministry of Health, 1960). Many of these deaths were preventable. In this respect we wish to make a plea for the greater use of the "flying squad" and adequate provision of hospital beds.

Jones *et al.*, quoting the Emergency Bed Service Report, said that the problem of admitting cases of abortion to hospital was second only to that of the chronic sick (*Lancet*, 1951). In a memorandum on the admission of abortions submitted to the North-West Metropolitan Regional Hospital Board, they proposed that each hospital management committee area should set up special gynaecological centres to which abortions could be sent.

Since the establishment of this unit, abortions are admitted from a wider district than that normally served by the hospital. Their admission is no problem and is not resented, since they do not interfere with the gynaecological ward. Over the years the treatment has evolved into a routine which is convenient and, we believe, efficient.

Summary

2,327 cases of abortion admitted to an abortion unit over a two-year period are reviewed and the results achieved with a particular type of treatment analysed.

62% of these abortions were inevitable or incomplete at the time of admission, and the reasons for the "interventionist" type of treatment adopted are set out.

Favourable results were achieved with bed rest and sedation in cases of threatened abortion.

The value of plasma and blood transfusions and the dangers of dextran administration are discussed.

Active and passive treatment are placed in their proper perspective in regard to septic abortions, having due regard to the availability of modern ancillary measures.

The problem of missed abortions is reviewed. It is suggested that pitocin drips in high concentration should prove satisfactory.

The low mortality rate of 0.06% was achieved by a set plan of management. It also reflects the part played by an efficient blood transfusion service and antibiotics.

However, mortality figures for abortions in general leave no place for complacency. It is suggested that greater use of the "flying squad," provision of more hospital beds, and establishment of special centres would help in great measure to reduce the mortality and subsequent morbidity associated with abortions.

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INTRANASAL USE OF SYNTHETIC OXYTOCIN IN MANAGEMENT OF BREAST-FEEDING

BY

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The role of oxytocin in the initiation and maintenance of lactation is now well established (Petersen, 1944; Cross, 1955; Berde, 1959). It has been used clinically as a means of inducing milk ejection for some time (Newton and Newton, 1948, 1951). Soon after oxytocin had been synthesized by du Vigneaud *et al.* (1953) it was shown that synthetic oxytocin exerted the same effect on the myoepithelial cells of the mammary gland as the naturally occurring hormone (Nickerson *et al.*, 1954; Berde and Cerletti, 1957; Beller *et al.*, 1958). Oral and nasal applications of the posterior pituitary hormones have been used for many years (Donaldson, 1921; Hofbauer *et al.*, 1927).

Recently several papers have appeared concerning the intranasal use of synthetic oxytocin. Berde and Cerletti (1960) have compared the effects of administering oxytocin by the intravenous, intramuscular, and intranasal routes on the lactating mammary gland of the rabbit. Newton and Egli (1958) studied the effect of intranasal oxytocin in lactating women. Baumgarten and Hofhansl (1959) and Baumgarten and Watzek (1959) showed that the intranasal administration of oxytocin induced ejection of milk within 70 seconds of inhaling five international units, and also that it was effective in relieving engorgement of the breasts. Hollenbach (1959), Stewart and Nelson (1959), and Wenner (1959) have all used the spray with good effect in the management of breast-feeding. Hendricks and Gabel (1960) have used intranasal oxytocin for the induction of labour.

This report of a double-blind trial is the first to appear in this country concerning the intranasal use of synthetic oxytocin in the management of breast-feeding.

Plan of the Trial

Primigravidae with normally protractile nipples, who had been delivered spontaneously of normal healthy infants, were selected for the trial. No twin pregnancies were included. The selection of patients was designed to exclude variables which might otherwise have occurred as the result of difficulty in establishing breast-feeding because of poor nipples or because the mother or the baby was ill. Fifty patients were issued with a nasal spray, which contained either synthetic oxytocin ("syntocinon") or an inert placebo solution with the same physical characteristics. The solutions were contained in small bottles at a pressure of one atmosphere and they were stored at 4° C. After inserting the nozzle of the spray into one nostril and occluding the other, it was operated by depressing the wings of the nozzle so that a fine spray of the contained solution could be inhaled. The active sprays contained approximately 5 ml. of a solution of oxytocin at a concentration of 40 I.U./ml. By depressing the nozzle while counting "one" and inhaling once the patient inhaled 4–5 I.U. of synthetic oxytocin.

Twenty-five sprays containing synthetic oxytocin and 25 containing the placebo were randomly issued to the selected patients, so that the contents of each bottle were unknown both to the patients and to the observer. The patients were instructed to inhale once from the spray about two to five minutes before starting each feed; treatment began with the first feed on the second day after delivery and continued until the contents of the bottle were exhausted.

Infants were put to the breast at three-hourly intervals for the first 48 hours after delivery; thereafter, in most cases, the time between feeds was extended to four-hourly intervals. Routine expression of the breasts, either before or after feeding, was not practised. Oestrogens were not given routinely, but only to patients who developed early engorgement of the breasts; in these cases 5 mg. of stilboestrol was given by mouth, and this dose was repeated if necessary.

Results

The results of treatment were evaluated by assessing the incidence of breast engorgement in the two groups, as judged by clinical observation and the necessity for the use of either oestrogens and/or analgesics. Two types of breast engorgement were distinguished, early (vascular) and late (milk) (Douglas *et al.*, 1957). These are distinct entities, the discomfort experienced by the patient is much the same, but the time of onset, cause, and treatment are vastly different. Engorgement was assessed arbitrarily. I examined the breasts each day and awarded a score for the degree of engorgement observed—that is, 0, +, ++, +++, ++++. In addition, the maximum loss of weight, the amount of weight gained since birth and the day of discharge or the tenth day after delivery (whichever was earlier), and the average size of feeds measured by test-weighing on the seventh day were recorded for each baby in the series.

One patient was rejected from the group using oxytocin because the baby was ill and could not be put to the breast; one patient issued with placebo spray was excluded from the trial because she failed to use it. Thus there were 24 patients in each group, and analysis of these groups showed that they were almost exactly comparable with regard to sex and weight distribution of the babies and also with regard to maternal age and the duration of pregnancy (Table I). The average length of use of the oxytocin spray was 70 hours (before 14 feeds) and of the placebo spray 78 hours (before 16 feeds).

No significant difference was found between the incidence of early breast engorgement in the treated and control groups. Two patients receiving oxytocin required stilboestrol for early engorgement and one other patient needed an analgesic (tab. codein. co.) for the same reason. Only one patient using the placebo spray was treated for early engorgement. There was no case of late breast engorgement in either group (Table II).

TABLE I.—*Distribution of Mothers and Babies Within the Treated and Control Groups*

Spray	No. of Patients in Each Group	Average Age of Patients (Range)	Duration of Pregnancy in Weeks	Ratio of Male to Female Infants	Average Weight of Babies (Range)	
					lb. oz.	g.
Oxytocin ..	24	23 (18–33)	37–42	11 : 13	7 11½ (5·7–8·6)	3,218 (2,585–3,900)
Placebo ..	24	24 (16–37)	38–42	13 : 11	7 2 (5·3–9·1)	3,232 (2,394–4,128)

TABLE II.—*Incidence of Breast Complications in the Treated and Control Groups* (24 *Patients in Each Group*)

Spray	No. of Patients with Breast Engorgement			No. Supervised with Feeding	Lactation Suppressed	Breast Abscess
	Early	Late	Requiring Treatment			
Oxytocin ..	7	—	3	—	2	—
Placebo ..	5	—	1	6	8	1
Significance* (P<0·05)	0·5	—	0·25	0·02	0·05–0·02	0·5

* Statistical significance was calculated by comparing the samples using the χ^2 distribution.

TABLE III.—*Average Loss and Gain in Weight and the Size of Feeds Taken by Babies of Mothers in the Treated and Control Groups* (*There were* 24 *Patients in Each Group*)

Spray	Average Weight Loss on 4th day		Average Size of Feed on 7th day		Total Weight Gain from Birth until Discharge or 10th day	
	oz.	g.	oz.	g.	oz.	g.
Oxytocin	5·0	142	3·4	97	1·2	34
Placebo	7·3	207	2·3	65	0·8	23
Significance* (P<0·05)	0·02–0·01		<0·001		0·2–0·1	

* Statistical significance was calculated by estimating the standard deviation of the difference of the means and applying the t-test.

The amount of supervision given by the midwives to patients during breast-feeding on the fifth day was noted. None of the patients using oxytocin required supervision, whereas six of those using the placebo needed some help. This difference is statistically significant (P=0.02). Two patients using the synthetic oxytocin spray had lactation suppressed—one because of insufficient lactation and the other because of persistently cracked nipples; whereas eight of the patients using the placebo spray had lactation suppressed—six because it was insufficient, one because of sore nipples, and the other on the fourth day at the mother's own request. This difference is also within the range of statistical significance (P=0.05–0.02). Only one of the patients in the trial developed a breast abscess; she had used the placebo spray, and it occurred six weeks after delivery.

The babies of mothers who had used the oxytocin spray lost less weight on the fourth day (5 oz.; 142 g.) than the controls (7.3 oz.; 207 g.). Mothers who had been given synthetic oxytocin gave bigger average feeds on the seventh day than those who had used the placebo. The average feed, as measured by test-weighing, was 3.4 oz. (97 g.) in the treated group compared with 2.3 oz. (65 g.) in the control group. The differences between these two sets of observations, and especially the latter, are statistically significant (Table III). Although it is not of statistical significance, there was also a bigger average weight gain, 1.2 oz. (34 g.) in the treated group compared with 0.8 oz. (23 g.) in the control group.

The only side-effect observed was slight bleeding from the nose in one patient after using an oxytocin spray.

Discussion

This small series provides no evidence that the regular intranasal use of synthetic oxytocin from the second day of the puerperium had any effect in reducing the incidence of breast engorgement. The galactokinetic effect of oxytocin could only be expected to affect the incidence of late engorgement, which is due to the breasts being full of milk that will not flow freely. The majority of patients had finished their sprays by the fifth day, before the expected time of onset of milk-engorgement in primiparae; and, as in theory oxytocin should have no effect in early or vascular engorgement, the negative evidence of the trial in this respect is therefore not surprising and no conclusions can be drawn from it. To observe the effects of oxytocin in the treatment of late breast engorgement the spray would have to be used either later in the puerperium or for a much longer period of time.

The significant reduction in the number of patients in whom lactation was suppressed and who required supervision with breast-feeding in the treated group suggests that the regular intranasal use of synthetic oxytocin did have some effect in rendering the establishment of breast-feeding easier and more successful. This was also reflected in the behaviour of the babies whose mothers had received oxytocin—namely, the smaller average loss in weight and the bigger average test feeds.

Two explanations are possible to account for the greater ease in the establishment of breast-feeding and the improved milk production. The first is that the regular intranasal use of oxytocin ensured more complete, more rapid, and easier emptying of the breast by the baby. From our clinical observations this certainly occurred, and was undoubtedly the result of oxytocin provoking and enhancing the ejection of milk; the more efficient emptying of the breast might then have led secondarily to a greater secretion of milk (Cross, 1957). The other explanation is that oxytocin exerts a galactopoietic as well as a galactokinetic effect (Benson and Folley, 1956a). Benson and Folley (1956b, 1957) and Benson *et al.* (1960) have shown that oxytocin retards mammary involution in rats; and other workers (Ôta and Yokoyama, 1958) have also postulated that oxytocin released in the puerperium in response to suckling exerts a central effect, as well as a local and peripheral action—that is, the initiation of milk-ejection—by stimulating the

release of prolactin from the anterior pituitary gland. Further clinical and experimental work is necessary to elucidate the role of oxytocin in this respect.

Summary

Oxytocin was regularly administered by means of a nasal spray to primiparae from the second day of the puerperium. No serious side-effects were noted. The use of the spray resulted in the easier establishment of breast-feeding and in an improvement of milk production. No significant reduction in the incidence of early breast engorgement was obtained. Nasal oxytocin has a place in the management of lactation and breast-feeding, but further work is necessary to define its usefulness more exactly and to elucidate the underlying physiological mechanisms.

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A joint meeting of the two main committees of the 14th World Health Assembly has received a report which states that, out of 1,336m. people in currently or formerly malarious areas, 298m., or 22.3%, are now living in areas where malaria has been eradicated, while over 612m., 45.9%, are covered by malaria eradication programmes. Preliminary malaria eradication activities (pre-eradication surveys and pilot projects) are now under way in areas containing a population of 170m., 12.7%. A population of 255m., 19.1%, is still living in areas where no eradication scheme has been planned. The report points out that a number of malaria eradication programmes have not progressed according to schedule, for technical, operational or administrative reasons, and "experience has shown that, while it is relatively easy to find solutions to technical and operational shortcomings, it is much more difficult to correct administrative imperfections."

PREVALENCE AND NATURAL HISTORY OF ASTHMA IN SCHOOLCHILDREN

BY

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Information regarding the prevalence of asthma in children is not extensive. Logan and Cushion (1958) reported that in a number of general practices in England and Wales, 1.23% of boys and 0.64% of girls under 15 years were known to have asthma. These figures are likely to be below the true prevalence of the condition, since many children receive no treatment from the family doctor either because the condition is mild or because remedies are obtained elsewhere. In Bergen, Eilertsen (1954) found a prevalence of 1.77% in children of 7, and in Stockholm, Kraepelien (1954) found an overall prevalence in children of 7 to 14 of 1.37%, which fell from 1.61% in those aged 7 to 0.87% in those aged 14. Neither of the Scandinavian authors separated the sexes.

An asthma clinic for schoolchildren within the school health service was started in Birmingham in 1953, and in 1956 an attempt was begun to study the prevalence of asthma in schoolchildren in the city. The investigation was undertaken with the assistance of the school medical officers and was carried out during the 12 months from September, 1956, to October, 1957.

Method of Investigation

Schoolchildren in Birmingham are examined at three routine medical inspections. The first is normally during the first year at school when they are 5 or 6, the second is five years later when they are 10 or 11, and the final inspection is just before they leave school and they are then 13 to 15. The school medical officers were asked to identify and record all children with asthma, as defined in the protocol, found at these medical inspections and to make inquiries regarding asthma in all children who, because of sickness or for any other reason, were not at the medical inspection but were on the nominal roll of those due for examination at that time. Care was also taken to find out which children in special schools, residential and non-residential, suffered from asthma among those in the age-groups used for medical inspections. It was felt necessary to make specific inquiry in the case of each child regarding the presence of asthma. As already mentioned, the condition may give rise to no serious distress in children mildly affected and to no loss of school time.

For the purpose of the investigation "asthma" was defined simply as recurrent wheezing and dyspnoea not known to be of extrapulmonary origin. At first sight this definition might appear too simple, but from experience it was known that a mistake in a positive diagnosis of asthma in children of school age is extremely rare. In over 500 cases referred to the asthma clinic by a large number of practitioners none had been mistaken. Such confidence in the diagnosis would not be possible in younger children or in adults. The diagnosis was checked in the first 173 cases reported in

this survey, but in no case was there any doubt that it was correct, so the rest were accepted.

It should be noted that the fact that the diagnosis was never found to be in error suggests that some very mild cases might have been missed. There was some variation in the numbers reported by individual medical officers, but, except in one case where the doctor became seriously ill during the period, the variation was not excessive. This might be due to a variation in zeal, but there is also a variation in occurrence as between different districts in the city. Maunsell (1956) plotted her cases on a map of London and suggested that they lived mainly where the soil was damp and where rivers or canals ran underground. By plotting the survey cases living at home and attending ordinary schools on a map of Birmingham the distribution was found to be very similar to that of 710 consecutive cases referred to the asthma clinic by their family doctor (Fig. 1).

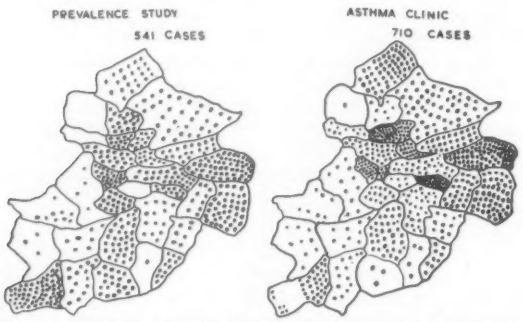

FIG. 1.—Diagrams showing distribution of cases of asthma in Birmingham schoolchildren and that of consecutive cases referred to the asthma clinic.

Results

The results of the survey are shown in Table I. The overall prevalence was 1.76%, which is in keeping with that reported from Bergen and from Stockholm. The prevalence in boys fell steeply from 2.58% in the youngest group to 1.96% in the oldest group, a difference which is statistically significant. At all ages there was a significant difference between the prevalence in boys and that in girls, which was much lower and did not vary greatly as between the age-groups.

TABLE I.—*Prevalence of Asthma in Birmingham Schoolchildren* 1956–7

Age in Years	Boys			Girls			Both Sexes		
	Total No.	With Asthma		Total	With Asthma		Total No.	With Asthma	
		No.	%		No.	%		No.	%
5 and 6	8,785	227	2·58	7,993	82	1·02	16,778	309	1·84
10 and 11	8,635	202	2·33	7,924	101	1·29	16,559	303	1·83
13, 14, 15	7,719	152	1·96	8,217	100	1·21	15,936	252	1·58
Total ..	25,139	581	2·31	24,134	283	1·17	49,273	864	1·76

Discussion

Williams (1959) found the figures for adult populations from most parts of the world to be in rough agreement and the most generally accepted figure appeared to be 0.9% for both sexes. Asthma caused 0.9% of rejections for the armed Forces at the age of 18 years in the United Kingdom and rather less in the United States. If we accept that in early adult life there is a prevalence in both sexes of 0.9% we can extend the impression gained so far of the natural history of the condition. This is illustrated in Fig. 2.

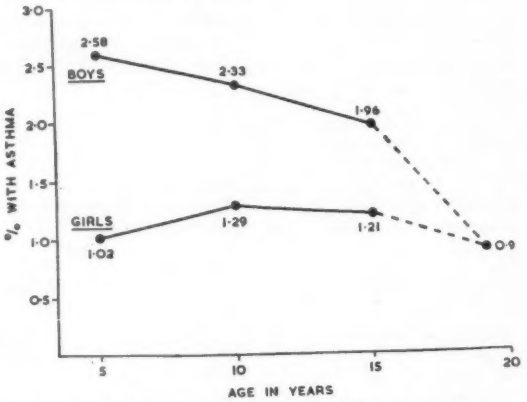

FIG. 2.—Prevalence of asthma in relation to age and sex.

The age at onset of asthma does not seem to differ greatly in boys and girls. Table II shows the age at onset of 535 consecutive patients referred to the asthma clinic. It seems unlikely that the age at onset of the disease has anything to do with the sex difference.

TABLE II.—*Age at Onset of Asthma*

Age	Boys			Girls		
	No.	% Age		No.	% Age	
<1	95	24·49	83·25	28	19·06	86·40
1–	55	14·18		15	10·20	
2–	61	15·72		31	21·10	
3–	51	13·15		19	12·92	
4–	33	8·50		17	11·56	
5–	28	7·21		17	11·56	
6+	65	16·75		20	13·60	
All	388	100		147	100	

A difference in severity might account for the sex difference. Among the cases seen at the asthma clinic it was possible to differentiate three groups according to severity. In about 10% of cases the asthma was so severe that the children managed to attend school for only short periods, and these children generally suffered educationally. In about 30% the condition was so mild that they hardly ever lost time from school because of asthma. The remainder lost time but managed to maintain their places in school with other

TABLE III.—205 *Clinic Cases in the Three Survey Age-groups*

	Age 5–6			Age 10–11			Age 13–15			Total		
	All Cases	Mild Cases		All Cases	Mild Cases		All Cases	Mild Cases		All Cases	Mild Cases	
		No.	%		No.	%		No.	%		No.	%
Boys	59	18	30·5	53	18	33·9	31	8	25·8	143	44	30·8
Girls	25	9	36·0	26	11	42·3	11	5	45·4	62	25	41·9
Total ..	84	27	32·1	79	29	36·7	42	13	30·9	205	69	33·66

children of similar age and intelligence. The mild group was easily defined, and from cases attending the clinic, grouped according to the age-groups used for medical inspections, the mild cases were selected. Table III shows these figures.

The percentage of mild cases in each of the three age-groups does not differ greatly as between the sexes, but on the whole it is the girls rather than the boys who seem to have the higher proportion of mild cases. There is nothing here to suggest that severity has a marked bearing on the trend shown and that boys tend to recover because they have milder asthma than girls.

The influence of environment might affect the course of the disease and account for the sex difference. In this country, however, we treat boys and girls very much the same up to the age of 15, and it is difficult to accept that a difference in environment could account for it. It is strange that the sex difference should be slowly abolished as puberty occurs and adult life approaches. If it were due to a hormonal difference the opposite would be expected. It is too difficult and uncertain to attempt to estimate hormonal activity in large numbers of children with the techniques at present available. There must, however, be some explanation for this clearly defined sex difference, which is in keeping with the experience of physicians such as Bray (1937) in this county and Dees (1957) in the United States, who reported that two to three boys attended their clinics for every girl. The phenomenon may provide a clue to some unknown factor in the aetiology of asthma even if we do not know where it leads at present.

Summary

An investigation of the prevalence of asthma among schoolchildren in Birmingham revealed an overall prevalence of 1.76%, which is in keeping with Scandinavian reports. There was a striking sex difference in that asthma was much more prevalent in boys than in girls. This was greatest in the youngest age-group and least in the oldest age-group owing to a falling prevalence in boys while that in girls remained almost stationary. There is evidence that the fall in prevalence in boys continues, so that in early adult life the sex difference is abolished. Although the explanation of the sex difference in the natural history of asthma cannot at present be explained it is thought to provide a possible clue to some important factor in the aetiology which has yet to be discovered.

This survey could not have been undertaken without the help of Dr. H. M. Cohen, the Principal Medical Officer for Schools in Birmingham, and his staff. I am indebted to Miss C. Butt, the school health visitor attached to the asthma clinic, for her help; to Mrs. D. Bailey for secretarial assistance; and to Dr. D. A. Williams, of Cardiff, and Dr. V. H. Springett, of Birmingham, for their encouragement and criticism.

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NEW DATA ON THE PATHOLOGY OF "TRUE SCLERODERMA KIDNEY"

BY

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[WITH SPECIAL PLATE]

Scleroderma, or progressive systemic sclerosis, is known to produce in certain rare cases characteristic morphological changes in the kidneys, accompanied by symptoms of rapidly developing and mostly fatal renal insufficiency.

The morphological pattern—in the proximal part of the interlobular arteries, mucoid intimal thickening with gross reduction in lumen; in the distal part, fibrinoid necrosis involving also the arterioles and a more or less pronounced ischaemic necrosis in the renal cortex—is diagnostically characteristic of scleroderma and constitutes what has been called "true scleroderma kidney" (Calvert and Owen, 1956).

Material and Methods

The discrepancy between the marked morphological changes and the virtual absence of clinical symptoms in the early stages led us to investigate with more sensitive methods the renal function of 25 patients suffering from scleroderma of varying severity. On routine clinical examination these patients showed no sign of renal disorder. We have, however, proved that in 80% of the cases the *para*-aminohippurate (P.A.H.) clearance (indicating effective renal plasma flow—R.P.F.) was reduced, while endogenous creatinine clearance ($C_{Cr.}$ a measure of glomerular filtration) remained normal and the filtration fraction (F.F.) increased. On the basis of the above we assumed that reduced R.P.F. indicates sclerodermal renal involvement much earlier than do ordinary clinical tests (Urai *et al.*, 1958). Rodnan *et al.* (1957) assume renal vascular spasms in the pathogenesis of sclerodermal renal involvement and believe them to be similar to Raynaud's phenomenon.

There can thus be no doubt that the vascular structure of the affected sclerodermal kidney undergoes considerable changes. The histological picture, however, offers information only as to the character of these vascular changes. Morphological examination of the cases reported in the literature and of those in our own experience reveals a more or less severe lesion of all medium and small arteries, while a considerable part of the glomeruli seems morphologically intact.

As histological study does not provide adequate information on the vascular structure of the whole kidney, we sought another method of investigating this problem. This was supplied by Munkácsi's new corrosion preparation method (Munkácsi, 1957), in which a polyvinyl chloride solution is used. This method was utilized by Gömöri and co-workers (1960) to study the circulation of the hypoxic kidney. In their report they give a critical discussion of the technique and application of the method.

Below we describe a case of scleroderma showing no signs of renal involvement at the time of the patient's admission to hospital or in his past history. Acute renal insufficiency developed while he was in hospital, and progressed rapidly, leading to oliguria and death within three weeks.

Case Report

A 56-year-old man, formerly a worker in a sand-blasting shop, was under observation by us from April 14 to his death on June 12, 1959. In 1953 he was found to be suffering from silicosis which developed as an occupational disease. From 1956 onwards he complained of "pains in the joints," and from February, 1959, gradually progressive manifest sclerodermal changes of the skin developed. The histological pattern of a skin biopsy indicated a chronic sclerodermal process (Special Plate, Fig. 1). The patient suffered from dyspnoea on exertion and dysphagia.

Examination on admission (April 14) showed diffuse sclerodermal changes of the skin, silicotic changes in the lungs, signs of moderate cardiac decompensation, and a painful stiffness in the joints of the hands. Blood-pressure, 150/80 mm. Hg. Urine: specific gravity 1026; trace of protein; sediment contained one or two white blood cells; creatinine clearance 76 ml.; non-protein nitrogen 24 mg. per 100 ml. The daily diuresis varied between 800 and 1,600 ml. On April 29 urine analysis showed: specific gravity 1019; trace of protein; one or two white blood cells in the sediment. On May 12 creatinine clearance was 46 ml. and blood-pressure 160/100 mm. Hg. Daily diuresis varied between 900 and 1,100 ml. On May 22 urine analysis showed a specific gravity of 1010; protein 1+; sediment containing two or three white and red blood cells and one or two granular casts. Blood-pressure 220/110 mm. Hg. On May 28 the patient's condition deteriorated suddenly, and he vomited several times a day. Blood-pressure rose to 230/140 mm. Hg and non-protein nitrogen was 45 mg. per 100 ml. He was given a daily infusion of 1,000–1,500 ml. of Ringer's solution, and his daily diuresis was between 900 and 1,600 ml. On June 3 urine analysis showed: specific gravity 1010; protein 2+; sediment two or three white and red blood cells and one or two granular casts. Creatinine clearance 10 ml.; non-protein nitrogen 60 mg. per 100 ml.; blood-pressure 260/160 mm. Hg. The patient became stuporous. On June 5 the non-protein nitrogen was 96 mg. per 100 ml. With infusion of the same quantity of Ringer's solution the daily diuresis was only about 600 ml. The patient had fascicular twitches. On June 9 the total daily diuresis was not more than 360 ml. On June 10 the patient was again stuporous and had Kussmaul respiration. Creatinine clearance 4 ml.; non-protein nitrogen 147 mg. per 100 ml.; daily diuresis 170 ml. On June 11 the daily diuresis fell to 120 ml., and urine findings were: specific gravity 1010; protein 3+; non-protein nitrogen 174 mg. per 100 ml. The blood-pressure also fell suddenly, and the patient became comatose. He died on June 12, having excreted only 80 ml. urine during the day.

Post-mortem Findings

Post-mortem examination confirmed that death was due to sclerodermal renal involvement. The histological picture is in complete agreement with the morphological criteria of "true scleroderma kidney."

In the kidney all subdivisions of the arteries, starting from the origin of the interlobular arteries—occasionally even the arcuate arteries—showed pathological lesions, indicating a combination of productive endarteritis and necrotic panarteritis, endarteritis predominating in the larger vessels. Concentric proliferation of the intima consisted of mucoid connective tissue which stained metachromatically with toluidine blue. In the smaller distal arteries fibrinoid necrosis predominated and extended to a section or the whole of the vascular wall (Special Plate, Fig. 2). Cellular inflammatory reaction, even in and around the most damaged vessels, was conspicuously slight. The lumen of a number of vessels was almost completely occluded as a result of combined arteritis and thrombosis. In some of the afferent arterioles fibrinoid necrosis could be demonstrated. The glomeruli were generally intact, though in some fibrinoid necrosis of the afferent arterioles had spread to part of the glomerular loops (Special Plate, Fig. 3). Because of vascular obstruction, numerous microinfarcts had developed in the subcapsular region of the renal cortex. Here and there small necroses appeared even in the medullary substance. The epithelium of the tubules showed regressive changes of varying severity and type, probably connected with anoxia: isolated necroses, hydropic hyaline droplets, or fatty degeneration, and epithelial atrophy with severe dilatation of the lumen. Some amorphous bodies were found in the distal channels. There was no noticeable change in the interstices, except a minor inflammatory reaction at the cortico-medullary demarcation.

Corrosion Preparation

A corrosion preparation was made of one kidney by filling it through the renal artery with a 5% polyvinyl chloride solution in a mixture of equal parts of cyclohexanone and acetone, and precipitating the polymer in the vascular system with 20% alcohol. The renal parenchyma was removed by corrosion in concentrated hydrochloric acid.

Owing to its viscosity the 5% polyvinyl chloride solution penetrated no further than the vas efferens. Hence by this method the interlobular arteries, the arterioles, and the glomeruli—that is, the entire renal vascular system up to the vas efferens, including the eventually present arteriovenous shunts—are filled, while the post-glomerular capillaries, the thinner vessels of the cortex corticis, and the capillaries of the medullary substance are not. Owing to the lack of transcapillary saturation, normal venous saturation does not occur.

Specimens of various segments of the arterial vascular system obtained in this way were prepared, mounted with Canada balsam on microscope slides, and examined stereomicroscopically. This method enables any lesions in the arterial system and the glomeruli to be determined. For comparison a similar corrosion preparation of a healthy kidney was made in the same way. This allowed the following conclusions on the renal vascular system of the scleroderma kidney to be drawn. All ventral and dorsal branches of the lobes of the renal artery had been well filled. The number of interlobular arteries was less than in the normal kidney, about one-third of them being missing (Special Plate, Figs. 4 and 5). The almost complete absence of glomeruli in the scleroderma kidney—about 98% were missing—was most characteristic. Those that were still visible were mainly at the cortico-medullary zone (Special Plate, Figs. 6 and 7). Though it is not certain that these were in fact juxtamedullary glomeruli, as their efferent arterioles had not been filled, their position nevertheless justified such an assumption. The crowded appearance of the aglomerular arterioles of the interlobular and interlobar arteries (arteriae rectae verae) was also characteristic. It is probable that, as a consequence of the obstructed glomeruli, this represented a dilated system of the vasa recta. In the region of the interlobular arteries in particular, we found a large number of such vascular structures (Special Plate, Fig. 8). A reduction of the lumen in many interlobar and interlobular arteries corresponding to the negative cast of the intimal proliferation on the histological slide (Special Plate, Fig. 9) was also observed.

Discussion

Examination of the corrosion preparation of this scleroderma kidney showed that circulation through the glomeruli ceased not only in the subcapsular region of the kidney—corresponding to the microinfarcts which had developed in this region—but also in practically the entire cortex except for the juxtamedullary layer. This

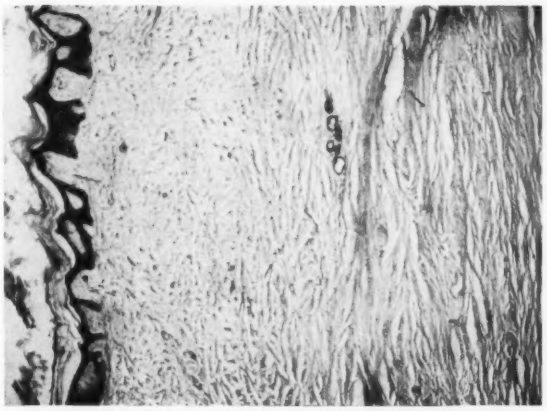

FIG. 1.—Skin biopsy showing chronic sclerodermal process.

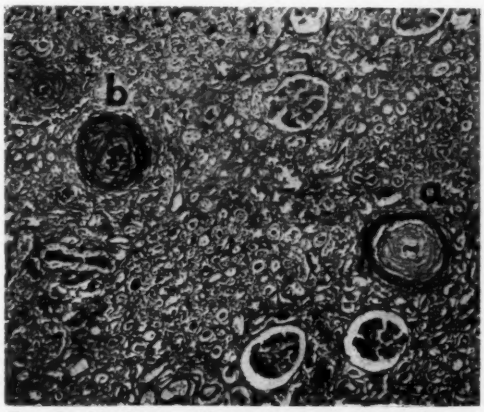

FIG. 2.—(*a*) Artery with much-reduced lumen due to productive endarteritis. (*b*) Artery of same size as (*a*) with fibrinoid necrosis in its walls, its lumen filled by thrombus.

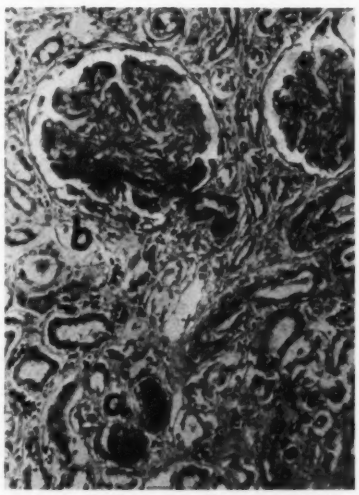

FIG. 3.—(*a*) Necrotic afferent arterioles. (*b*) Fibrinoid necrosis spreading from afferent arterioles to glomerular loops.

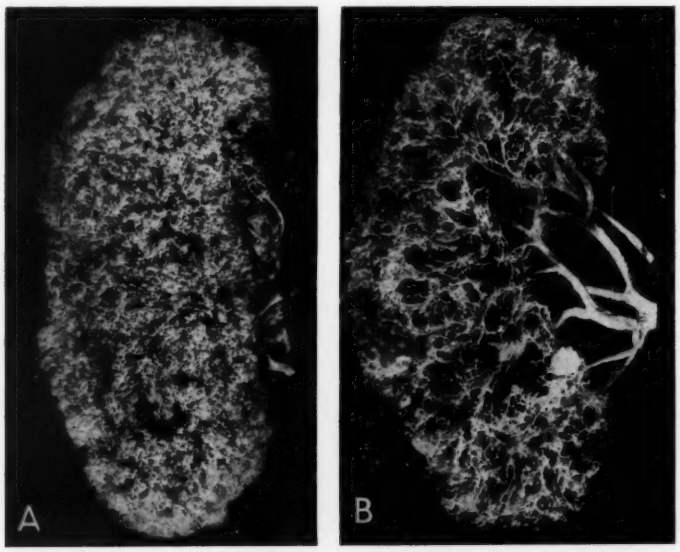

FIG. 4.—Photographs (slightly reduced) of corrosion preparations of (A) a healthy kidney and (B) a scleroderma kidney. The poorer vascular system of the scleroderma kidney is evident.

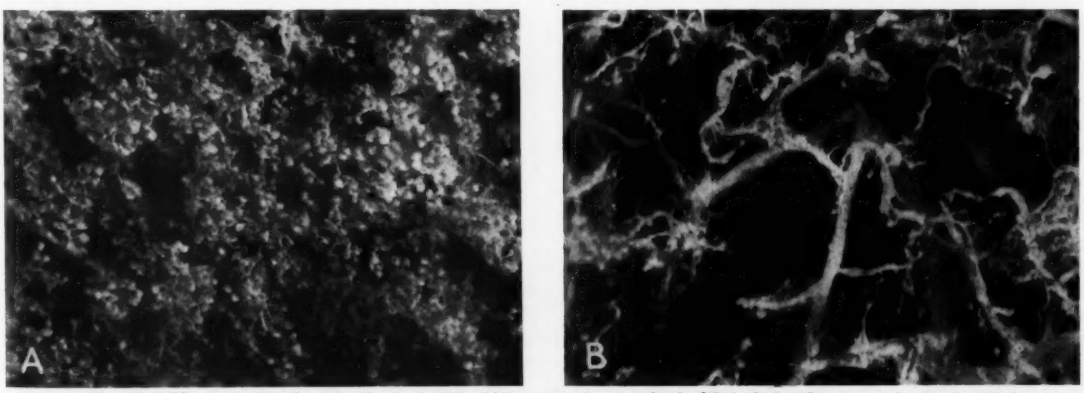

FIG. 5.—Detail of Fig. 4 much enlarged. In the healthy kidney (A) the completely filled glomerular system is clearly visible. In the scleroderma kidney (B) the larger arteries can be seen in the background with a paucity of interlobular arteries and an almost complete absence of filled glomeruli.

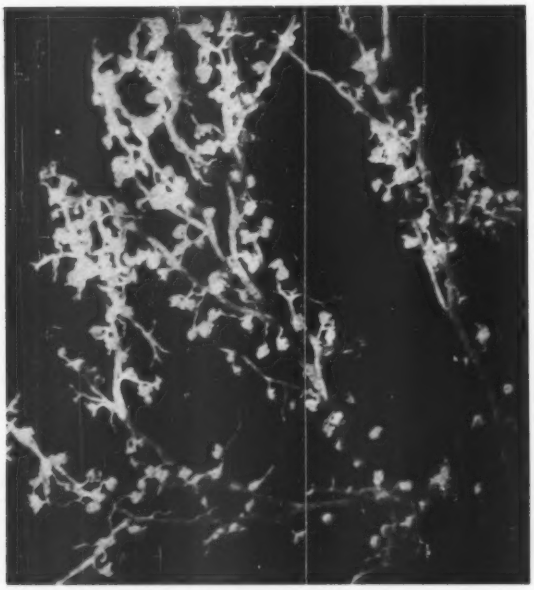

FIG. 6.—Lateral view of interlobular arteries of a normal kidney. Note the complete, well-filled system of glomeruli.

FIG. 7.—Scleroderma kidney, same position and enlargement as Fig. 6. The vascular region contains very few glomeruli and a reduced number of interlobular arteries.

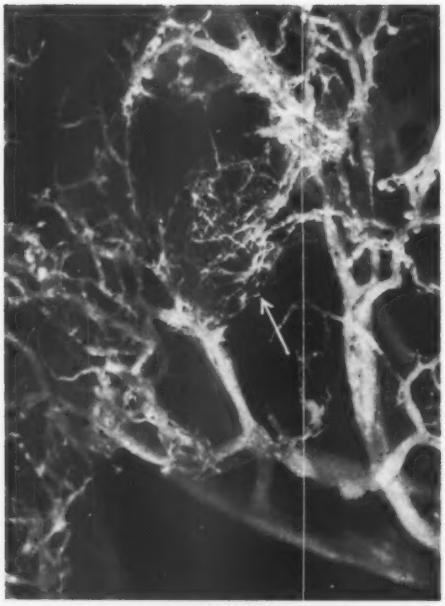

FIG. 8.—Lateral view of a segment of the vascular system of the scleroderma kidney. The arrow indicates the aglomerular vessels.

FIG. 9.—Lateral view of a segment of the vascular system of the scleroderma kidney. The arrows indicate the reductions in lumen of the corrosion preparation corresponding to the intimal proliferations of the interlobular arteries as seen histologically.

is due to the fact that, starting from the interlobular arteries, sclerodermal vascular changes had become so serious in some sections of most vessels as to cause total obstruction of the lumen. One-third of the interlobular arteries were missing, while in the remainder the lumen was so narrowed that the polymer used could no longer fill the majority of the arterioles originating from them. This explains why, with the exception of those at the cortico-medullary zone, only a small percentage of the glomeruli were filled.

In the histological preparations necrosis could be seen wherever the interlobular arteries or their proximal vascular segments had been obstructed. The question now arises: Why did massive tubular necrosis not develop in other regions, though the afferent arterioles and glomeruli were almost completely missing? It is generally accepted that the tubules in the region of the cortex are fed by the post-glomerular capillary system, but in our opinion this discrepancy can be explained by the fact that the post-glomerular plexus receives anastomoses for the maintenance of the circulation from the aglomerular arteries. Apart from the widespread absence of glomeruli, the outstanding feature of the corrosion preparation was just such a marked dilatation of the aglomerular arteries and a relative increase in their number. Although we were unable to demonstrate in the corrosion preparation the presence of an arteriovenous connexion, it might nevertheless be assumed that —because of the obstructed glomeruli—this dilated vasa recta system fulfils in the living organism the role of the secondary opened "functional" shunts. This might partly explain the fact that, as we have shown in previous investigations, the morphological and functional integrity of the tubules is maintained for a relatively long time in spite of the marked reduction in the flow of blood through the kidney (Urai *et al.*, 1958).

While about 98% of the glomeruli are missing in the corrosion preparation, in the histological preparations about 60% are morphologically intact. This discrepancy is probably due to the fact that in many places the obstruction of the afferent vessels is not complete, but they are so narrowed that the polymer used for the corrosion preparation is unable to penetrate them. Such narrowing of the lumen, however, makes it probable that the much reduced transglomerular circulation is no longer sufficient to maintain filtration pressure in the glomeruli. Luminal reduction of the arterial system is obviously extremely rapid, for only this can account for the fact that the quantity of urine excreted decreased within 10 days from 1,000 ml. a day to almost nothing, simultaneously with the reduction of creatinine clearance to 4 ml. and the development of uraemia. The practically complete loss of glomeruli which followed these vascular changes might also explain the patient's rapid deterioration and death.

Death due to characteristic sclerodermal renal involvement is relatively rare, and we have been able to use Munkácsi's method of examining these renal changes in only one case. It was, however, a typical one from both the clinical and histological viewpoints.

Summary

One of the kidneys of a patient suffering from scleroderma, who died from renal failure within three weeks, was examined by Munkácsi's corrosion preparation method. The histological picture corresponded to the morphological criteria of a "true scleroderma kidney." The majority of the interlobular arteries and arterioles were almost completely obstructed, corresponding to the obstructions seen histologically. This resulted in a sharp decrease in glomerular filling. A considerable increase in the number of aglomerular arteries was demonstrated.

On the basis of these findings the connexion between the morphological pattern and the clinical data is discussed.

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A CASE OF RUPTURED UTERUS AND CARDIAC ARREST, WITH RECOVERY

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Rupture of the uterus occurs approximately once in every 1,500 deliveries (Morrison and Douglass, 1945), and usually a definite predisposing factor can be incriminated. This is a potentially lethal condition as shown by the Ministry of Health (1960) report, in which it is stated that 33 patients died in England and Wales as a sequel to ruptured uterus. We feel that the following case is both interesting and unusual because of the uncertain nature of its origin and the rather alarming sequel to its treatment.

Case History

The patient, a married woman aged 27, was expecting her second baby on August 30, 1958. The first child, weighing 6 lb. 6 oz. (2,992 g.), was delivered normally in 1954 after a labour lasting six hours and ten minutes. There had been no complications in the puerperium. In February, 1956, a diagnostic curettage was performed at St. James' Hospital, Balham, for menorrhagia, and the histopathological examination showed "fragments of endometrium displaying chronic inflammatory changes." There had been no post-operative complications and nothing to suggest that the uterus was perforated at that time. Her menorrhagia had ceased after this procedure. She miscarried, spontaneously, at eight weeks in 1957, and was treated at home. There was no other relevant past history.

Her antenatal care was undertaken by her own doctor (M. K. T.), who first saw her at 22 weeks. He recorded the following: blood-pressure 130/80 mm. Hg, no oedema, urine clear, weight 11 st. 8 lb. (73.5 kg.), height 5 ft. 3 in. (160 cm.), blood group A, rhesus-positive, and haemoglobin 13.5 g./100 ml.

External cephalic version was attempted, unsuccessfully, at the thirty-second week, but a week later spontaneous version had occurred. Two days before term her blood-pressure, which previously had not exceeded the original reading, was 130/90 mm. Hg, and there was slight pretibial

oedema, but the urine was clear. The foetus presented as a vertex L.O.P., and the head was passing through the pelvic brim. A medical induction (oil-bath-enema sequence) was carried out at 8.30 o'clock next morning by the district midwife.

The membranes ruptured spontaneously six hours after the medical induction had been started. Labour pains began at 3 p.m., 30 minutes later, and at 5.15 p.m. the pains, which had been of good quality and recurring every two to three minutes, suddenly ceased. The midwife called the patient's own doctor (M. K. T.), who found that the head was not fully engaged, but the cervix was almost fully dilated and the presentation a vertex L.O.P. An hour later, as the pains had not returned, and as the foetal heart sounds had become irregular, the uterus diffusely tender, and the maternal pulse had risen from 80 to 92 a minute, she was referred to the Mayday Hospital and admitted there at 9.30 p.m. She was quite conscious and co-operative, but looked rather pale. She complained of a continuous, fairly severe, lower abdominal pain which was "bearing down" in character.

On examination the blood-pressure was 120/80 mm. Hg and pulse rate 92; her fingers were swollen, and there was moderate pretibial oedema. No abnormality was found in the urine. The abdomen was rather obese, but on palpation it was found that the fundus uteri reached to the level of the xiphisternum. There was an extremely tender area on the left side of the uterus, about midway between the fundus and the lower segment; and release tenderness could be elicited in both iliac fossa. Presentation of the foetus was vertex L.O.P. and the head was engaging. Foetal heart sounds could not be heard. It was noted that the uterus relaxed between mild contractions, and any movement by the patient caused an exacerbation of her lower abdominal pain, which was not referred to the shoulders.

Vaginal examination confirmed the presentation, and showed that the foetal head was approximately 3 cm. above the ischial spines. The pelvic capacity felt quite adequate. The cervix was three-quarters dilated, thin, and poorly applied to the foetal head. Tenderness and fullness could be elicited through the posterior fornix, and rectal examination confirmed this finding. Approximately 1 oz. (28 ml.) of blood was passed vaginally during this examination.

A provisional diagnosis of a ruptured uterus was made, and it was decided to do a laparotomy. Twenty minutes later, before leaving the ward, the patient stated that she had a continuous, very severe, generalized abdominal pain, made worse by any movement at all. At this time the blood-pressure was 120/80 mm. Hg and the pulse rate 100 a minute.

A general anaesthetic was given by a registrar, and a total of 300 mg. of thiopentone, 50 mg. of scoline, 75 mg. of pethidine, together with nitrous oxide/oxygen/cyclopropane, was used for the operation. The abdomen was explored through an oblique subumbilical incision, the findings being as follows. The peritoneal cavity contained approximately 2½ pints (1.4 litres) of fresh blood. The foetus, which was stillborn and weighed 5 lb. 14 oz. (38.1 kg.), was lying free in the peritoneal cavity, as were the placenta and membranes: this had apparently occurred within the previous 30 minutes. The uterus had retracted, and there was a ragged, oozing tear extending from within 1 in. (2.5 cm.) of the distal end of the cervix posteriorly, in an oblique direction almost as far as the left uterine cornua. There was no developmental abnormality of the uterus. The left broad ligament contained a large haematoma.

A total hysterectomy was performed with conservation of the adnexa.

During the closure of the pelvic peritoneum, the table was tilted about 15 degrees from the horizontal and a small dose of thiopentone was injected. After this the patient suddenly became very pale, her pupils dilated widely, and no peripheral pulse could be felt. Palpation of the abdominal aorta revealed no pulsation. By this stage the patient had had 3 pints (1.7 litres) of blood and 1 pint (570 ml.) of reconstituted plasma in the way of resuscitative measures.

It was decided to perform cardiac massage, and the pleural cavity was exposed by an incision through the fourth left intercostal space. The heart was observed to be in diastole, and adrenaline 1/320 gr. (0.2 mg.) was injected into the left ventricle and massage begun. The heart started to beat of its own accord so strongly that the peripheral pulse could readily be felt. It stopped again about two minutes later, but after further massage for approximately 30 seconds, recommenced contracting automatically and continued to do so. It was estimated that the original cardiac arrest had lasted approximately three minutes. The chest was closed with underwater drainage, and simultaneously the abdominal operation was completed. At this stage the blood-pressure was 120/88 mm. Hg and the pulse rate 148.

One and a half hours after return to the ward she had her first generalized convulsion.

Nine hours after the operation she was still unconscious; both legs were extended at the knee-joint and flexed at the ankle-joint. The arms were held stiffly in flexion at the elbow and the wrist. Any stimulus was liable to exacerbate the tonic spasm with the addition of screaming and baring of the teeth.

There was no plantar or superficial abdominal reflexes, the pupils did not react to light, and the axillary temperature was 101° F. (38.3° C.). It was decided to treat the patient along the following lines.

1. An oesophageal tube was passed to facilitate feeding and to anticipate the acute dilatation of the stomach which might occur.

2. To obviate any further brain damage by pressure of post-anoxic cerebral oedema, 1 pint (570 ml.) of triple-strength plasma was given intravenously in 20 minutes and an attempt made to maintain a rectal temperature of 90° F. (32.2° C.) by surface cooling with crushed ice, a fan, and the application of sheets wrung out in ice-cold water. Owing to the early appearance of ice burns on the legs and a high ambient temperature, this could not be achieved, and instead we had to be content not to let the temperature rise above 98° F. (36.7° C.).

3. To facilitate hypothermia and to provide autonomic and general sedation, 25 mg. of chlorpromazine was given intramuscularly every six hours.

4. General measures to prevent respiratory infection and collapse and to maintain adequate calorific and fluid intake were instituted. These included frequent changes of posture, intragastric feeding with "complan," and initially an intravenous infusion.

Because of the unimpaired pharyngeal and cough reflexes tracheostomy was not done. These measures are largely those laid down by Maciver *et al.* (1958) for the treatment of severe head injuries.

The patient remained in coma for one week, and there were frequent changes in neurological signs. A transient right facial palsy developed on the third day with flaccidity of the left arm. During the next two days the plantar reflexes reappeared as extensor responses, spontaneous movements were seen in all four limbs, and the pupils once more reacted to light. At this time cooling was stopped.

Tonic spasms with screaming still occurred during the first half of the next week, but on the ninth post-operative day the patient responded slowly, belatedly, and clumsily to simple requests, and by the end of the week was drinking fluids and able to sit in a chair. In the third week after operation she progressed to feeding herself and making grunting noises not recognizable as words. In the fourth week she was able to print and say her own name, and then to say short sentences. She was emotionally very labile and often wept.

The fifth and sixth weeks were a period of rapid improvement. She was no longer incontinent at night; she could walk without support, knit simple patterns, carry on a conversation, and read women's periodicals, but was still unable to perform tasks which required concentration, such as the simplest mental arithmetic.

At the time of her discharge from hospital, nine weeks after operation, she could walk well but still had a slurred speech and some ataxy of both arms. An electrocardiogram showed anterior ischaemia of the left ventricle.

Discussion

The discussion in this case can be conveniently divided into three sections.

Ruptured Uterus.—This was a case of gradual and complete rupture of the uterus in a fit young woman near term, who had had one previous uncomplicated confinement, one curettage, and one spontaneous abortion. This was a most unusual occurrence, and naturally a predisposing factor was sought. The only positive factors which emerged from a careful study of the case notes were: (1) an apparently uncomplicated curettage in 1956, (2) a spontaneous abortion in 1957, and (3) attempted external cephalic version at the thirty-second week of this pregnancy. None of the usual causes of ruptured uterus such as dystocia, previous caesarean section or myomectomy, developmental uterine abnormality, intrauterine manipulation, or grand multiparity could be incriminated. It was felt that the three positive factors mentioned were unlikely to have been of aetiological significance, and one is left with the feeling that this was a spontaneous rupture through the lower uterine segment.

Cardiac Arrest.—The probable reason for the cardiac arrest was a combination of haemorrhage, reflex hypotension, impedance of the venous return to the heart by the head-down tilt, and manually controlled respiration. Under these conditions the smallest supplementary dose of thiopentone would be likely to deliver the *coup de grâce* to an already tottering circulation. The clinical picture which followed operation—namely, tonic fits superimposed on a decerebrate posture with initial pyrexia, not completely thermolabile—bore a striking resemblance to those cerebral injuries with brain-stem damage and a good prognosis (Maciver *et al.*, 1958). It would seem that in this patient, anyway, the period of circulatory arrest and subsequent oedema and hyperaemia caused diffuse cerebral damage not confined to the cells of the cortex alone. There is a paucity of accounts describing the neurological progression after cardiac arrest with ensuing cerebral damage, and the present case is therefore reported in some detail.

Follow-up.—Twelve months later the patient was a reasonable member of society. Her husband thought that the only change, so far as he was concerned, was that whereas previously she had been extremely quick-tempered she was now quite the reverse. She managed her routine tasks adequately, and other than complete amnesia for the events of the first two to three weeks in hospital her memory was unimpaired. She still had some cerebellar dysfunction, as shown by her rather slurred speech and inability to perform the "past pointing" test. She walked normally and had no dysdiadochokinesia. The electrocardiogram tracing was now normal.

Summary

A case of ruptured uterus of uncertain aetiology occurred in a young woman. Cardiac arrest complicated the concluding stages of an abdominal hysterectomy, and cardiac massage was performed. The patient, after a very stormy post-operative period, made a reasonable recovery, as shown by her general condition 12 months after the occurrence of this catastrophe.

We thank Mr. A. F. Clift, consultant obstetrician and gynaecologist at the Mayday Hospital, who performed the hysterectomy, for permission to report this case.

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DIFFUSE INTRAPERITONEAL HAEMORRHAGE FROM SURFACE VEIN OF A FIBROMYOMA

BY

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Rupture of a vein on the surface of a uterine fibromyoma is an extremely rare event despite the fact that fibromyomata are the commonest tumours in the uterus. In the first case to be reported (Rokitansky, 1861) the condition was discovered at necropsy of a girl who had died from internal abdominal haemorrhage. Other cases have been collected from the literature by Brunner (1910), 10 cases; Ernst and Gammeltoft (1922), 33 cases; and Hasskarl (1949), 60 cases.

Only five cases have been reported in the British literature in the past 50 years (Woodruff, 1948; Davies, 1950; Sheehan, 1951; McNeil, 1952). Few other cases have been reported in the world literature recently (Bosch, Carter, and O'Grady, 1950; Kaye and Ficarra, 1950; Rømer, 1951; Zajac, 1952; Li and Braden, 1952).

Aetiology

There has been much speculation regarding the factors which precipitate rupture of the veins on the surface of fibroid tumours. Trauma such as a direct blow to the abdomen, abdominal massage, a fall, or violent coitus, and injury to a vein by the sacral promontory have all been blamed. Increased intra-abdominal pressure may increase the venous pressure so much that the veins give way. Increased congestion of the tumour during menstruation has been blamed by Davies (1950). McNeil (1952) postulated that the source of bleeding may be torn adhesions between the tumour and the posterior peritoneum. In the report by Pineda (1945) of a case in which red-cell degeneration was found in the myoma, it was suggested that the extension of the degenerative process into the vessel wall had been responsible for rupture of the veins. In 2 out of 29 cases reviewed by Polacco (1932) the source of bleeding was arterial, and essential hypertension was regarded as the precipitating cause.

Twisting of the pedicle of a subserous myoma was held responsible in 10 out of 60 cases collected from the world literature by Hasskarl (1949). Pregnancy causes dilatation of the veins on the surface of fibroids

and thus makes them more likely to rupture. One of Greenhill's (1947) three cases occurred during pregnancy, and he collected from the literature 14 other such cases.

Clinical Picture

The condition produces acute abdominal symptoms which make an exploratory laparotomy imperative, but rarely has the correct diagnosis been made pre-operatively—for example, in only 4 of the 60 cases collected by Hasskarl. The usual diagnosis in these cases was ectopic gestation, torsion of an ovarian cyst or fibroid tumour, ruptured viscus, or acute appendicitis.

Treatment

The most usual operative procedure in the cases reviewed has been subtotal hysterectomy because of the bad general condition of the patient. In some cases total hysterectomy was performed and in others myomectomy. In one case, owing to the desperate state of the patient at the time of the operation, ligation of the bleeding vein was all that was done. The present case is considered worth reporting because of the rarity of the condition and because the age of the patient (22 years) is the youngest yet reported.

Case Report

A parous married woman aged 22 was admitted to Kasr-el-Aini Hospital on September 8, 1957, with dyspnoea and severe abdominal pain. She had had one abortion at four months and one full-term pregnancy. Menstruation reappeared six months after delivery. After two normal periods, there was amenorrhoea for 65 days, followed by bleeding for 30 days, and then she was suddenly stricken by severe abdominal pain while defaecating. The pain grew worse, and three hours later she fell to the floor unconscious. She regained consciousness after 20 minutes and asked for medical aid. A practitioner examined her and considered her pregnant with threatened abortion. He prescribed a sedative and advised rest in bed, but her pain became still worse and next morning she was admitted to hospital.

Physical examination revealed a short woman with a weak pulse of 120 a minute. The temperature was 37.5° C. She was very pale, and her skin was cold and covered by beads of perspiration. The blood-pressure was 90/60, and respirations 36 a minute. The chest and heart were normal. The abdomen was distended, with generalized tenderness and rigidity, most pronounced over the suprapubic region. On vaginal examination there was severe pain on moving the cervix and the fornices were very tender. The cervix was rather soft. There was fullness in the suprapubic region, but the outline of the uterus could not be made out owing to rigidity of the abdominal muscles and tenderness on examination.

Because of the sudden onset of pain, the amenorrhoea followed by bleeding, and the softness of the cervix a diagnosis of ruptured ectopic gestation with diffuse intra-peritoneal haemorrhage was made. Under ether anaesthesia the abdomen was opened and the peritoneal cavity was found to contain a large amount of blood. The uterus was the size of a 16-weeks pregnancy and was soft and vascular. On the anterior wall of the uterus, near the fundus, there was a bruised area, on the surface of which was a bleeding vein. The vein was caught by pressure forceps and the blood was mopped out of the abdominal cavity. On further exploration a band of omentum was found, bruised at its free end, which was oozing. This band was clamped and ligated. The ovaries and the tubes were normal. On palpating the uterus, it was found to contain a myoma underneath the bleeding vein and many dilated veins were seen coursing over the surface of the uterus. A rubber tourniquet was applied around the body of the uterus and a myoma the size of a large orange was removed. Two small fibroid tumours were removed through the same incision. The endometrial cavity was opened and explored, but it did not contain any polypi. The enucleation cavity was closed, the peritoneal cavity was cleaned of blood, and a litre of blood was given during the operation and another litre after its completion.

The patient had a smooth convalescence and left hospital on the fourteenth post-operative day.

The pathological report stated that the three myomas removed from the uterus showed no evidence of degeneration or malignancy.

Comment.—In this case an omental band with haemorrhage from its free end was found; it must have been adherent to the surface of the uterus at the bleeding point, and been detached from the uterus while the patient was straining at stool. At the point of attachment of the omental band a dilated vein was coursing over the surface of the uterus. The vein was torn as a result and free intraperitoneal haemorrhage took place.

Summary

A case of diffuse intraperitoneal haemorrhage from the surface vein of a fibromyoma is reported.

The possible precipitating factors for the venous rupture are discussed.

I thank Professor Khalil Mazhar, head of the obstetric and gynaecological department, Kasr-el-Aini Hospital, for his advice and help.

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"I should like to emphasize this fact—that the law which we now have in Britain for the purpose of preventing cruelty in the laboratory was a sequel to a petition signed by Charles Darwin, Thomas Huxley, Jenner Owen, the President of the Royal College of Physicians, the President of the Royal College of Surgeons, and various other leaders of science and medicine. It was based on the recommendations of a Royal Commission which included among others Thomas Huxley, then President of the Royal Society, and Professor Erichsen, the surgeon. This law, which we still have, is badly drafted and difficult to understand, but it left a wide discretion to the Home Secretary and, with scientific guidance, that discretion was used to build up a humane and judicious tradition among laboratory workers. It has done a splendid job in the past, though the time has now come when the whole system needs to be modernized in order that it may continue to retain the confidence of biologists and at the same time give more assured effect to the three essential principles on which it is based and which are absolutely indispensable in any genuine system of control. These three principles are, first the licensing of experimenters, secondly the Home Office inspectorate, and thirdly the Pain Rule." (Major C. W. Hume, B.Sc., in *UFAW Courier*, Autumn, 1960.)

Preliminary Communications

Abnormal Restraints of Cleft Antero-medial Leaflet of Mitral Valve in Endocardial Cushion Defects

Studies of the normal mitral-valve closure (Barnard *et al.*, 1959, 1961) have shown that for practical purposes the valve orifice is guarded by two leaflets constituting a flap-type valve, activated by the differences in hydrostatic pressure between the atrial and the ventricular chambers, and passively restrained by their anchoring chordae and papillary muscles.

The antero-medial leaflet is much larger than the postero-lateral one, and the chordae are attached only to the peripheral zone of the cusp, leaving a triangular-shaped area, which is much thinner, free to billow towards the cavity of the left atrium during systole (Fig. 1). The closure of the mitral-valve orifice is thus mainly effected by the freely mobile antero-medial leaflet.

In endocardial cushion defects, with a cleft of the mitral valve, abnormal restraints are present. These ensure the support of those portions of the mitral valve nearer the cleft. Three such abnormal restraints have been observed (Fig. 2): (*a*) accessory mitral chordae which anchor the valvular tissue bordering on the cleft to the ventricular septum (Wakai and Edwards, 1956; Edwards, 1960; Barnard *et al.*, 1961); (b) chordae which anchor the cleft to the papillary muscles (note: in normal valves these chordae run only to the periphery of the cusp); and (*c*) a segment of the cleft, especially at the base, may be fused to the ventricular septum.

Once the cleft is closed, these restraints are no longer necessary, as the normally inserted chordae will prevent eversion of the cusp. Moreover, they now prevent the free mobility of the central portion of the cusp, and mitral insufficiency will persist although the cleft has been securely closed (Fig. 3).

Although several reports on the treatment of endocardial cushion defects have been published, the importance of free mobilization of the antero-medial leaflet of the mitral valve has been reported only by Edwards (1960), and surgeons have not recorded cases in which this manœuvre has been part of the surgical correction of the anomaly. In our experience a better correction of the mitral insufficiency has been achieved when these abnormal restraints are recognized and divided. In a series of 11 cases on which we have operated, the only death resulted from the incomplete correction of the mitral insufficiency at a stage when the importance of this aspect had not yet been recognized.

The division of the abnormal chordae facilitates the closure of the cleft, permits a better view of the ventricular septum, and allows free mobility of the newly formed antero-medial leaflet of the mitral valve.

Fortunately, the most common type of endocardial cushion defect is the one without a ventricular septal defect. When the mitral insufficiency is carefully corrected, the operative mortality in this group should approach that of ostium secundum atrial septal defects, which, in our hands, has been nil.

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Dental Extractions in Haemophilia: Plasma Therapy without Dental Splints

The days of single extractions in haemophiliacs have given way to multiple extractions in one session, with a maximum recorded number of 25 teeth in one operation (McIntyre *et al.*, 1959). However, the methods advocated remain somewhat cumbersome, with dental

FIG. 1

FIG. 2

FIG. 3

FIG. 1.—Normal antero-medial leaflet of mitral valve showing peripheral attachment of chordae tendineae and mobile central portion, which is completely free of restraints. FIG. 2.—Cleft antero-medial leaflet of mitral valve, as seen in endocardial cushion defects, showing the abnormal restraints. FIG. 3.—Cleft mitral valve corrected by simple suture without division of the abnormal restraints. This photograph clearly illustrates how the mobility of this leaflet will be impaired.

splints and transfusions as the mainstay of treatment, and even with these adjuncts to haemostasis, post-operative bleeding for at least a few days has been the rule rather than the exception. Recurrent oozing is a source of anxiety and fatigue to the patient and medical and nursing staffs, and the use of splints is not without its own hazards, such as traumatic bleeding from splint abrasion and parodontal infection around the teeth adjacent to the extraction sites, despite the use of systemic antibiotics. An attempt has been made to reduce to a minimum post-operative bleeding by the employment of a clearance-with-alveolectomy and gum-suturing technique, using as splints immediate dentures (Ingram and Winstock, 1960). Splints, however, produce traction on the sutured gum margins and so detract from the main objective, which is to maintain the gum margins in apposition until healing is assured. We have thus endeavoured to devise a method independent of splints.

CASE REPORT

A white man aged 34, a known severely afflicted haemophiliac with no detectable antihaemophilic globulin (A.H.G.) in the blood, had experienced numerous bleeding episodes, including spontaneous haemarthroses leading to permanent disability in both elbows. On admission he had a subconjunctival haemorrhage in his left eye. However, minor skin cuts had proved amenable to simple measures to arrest bleeding. His experience of dental extractions was nil and he had a full complement of 32 teeth, many of which were decayed down to the level of the gum margins (Fig. 1). Test infusions of approximately 1 litre of fresh citrated human plasma were given on two occasions, and his A.H.G. concentrations rose to 23% and 33% of average normal. These results were thought to exclude the existence of an anti-A.H.G. and to indicate that adequate A.H.G. cover could be given by infusion of whole plasma. On a regimen of 1.7 litres of plasma in 24 hours, the A.H.G. activity in his plasma was never observed to fall below 7% of average normal—that is, never below the spontaneous bleeding level. It has been suggested that A.H.G. deficiency may delay healing (Macfarlane *et al.*, 1957), and our intention was to raise the A.H.G. level well above 20% at the time of extractions and to keep it above 10% until healing was assured.

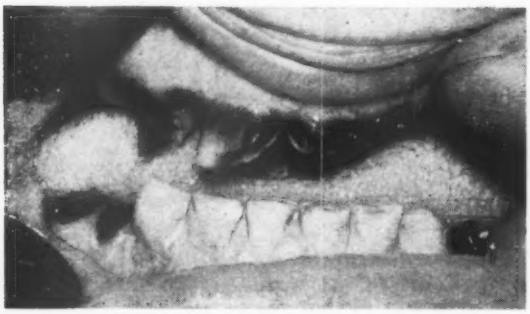

FIG. 1.—Appearance of anterior teeth.

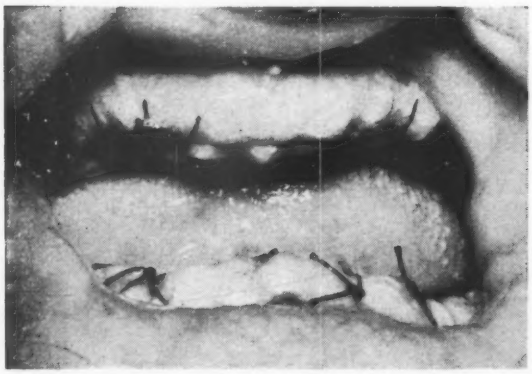

FIG. 2.—Appearance of gums on fifth post-operative day.

The extractions were performed under general, endotracheal anaesthesia, chlorpheniramine ("piriton") 10 mg. being administered systemically to counteract any possible untoward reactions to the plasma or the penicillin which was given orally. All 32 teeth were removed, the interdental gum papillae incised, and the gum flaps reflected so as to expose the alveolar bone, which was then resected approximately down to the levels of the apical one-thirds of the root sockets. The gingival flaps were then trimmed down to permit them to be coapted without undue tension. Small pieces of gelatin sponge were inserted in the sockets and the flaps sutured with interrupted silk sutures, 12 in each jaw. Operative bleeding was not excessive. Post-operative healing was uneventful and there was a total absence of any bleeding, nor did submucosal haemorrhages occur. The appearance of the gum on the fifth post-operative day is seen in Fig. 2.

The patient was fed on soft food and the gums were swabbed gently daily with 1% gentian violet. The sutures were removed on the seventh day, uncomplicated by oozing from suture holes, and the gum margins remained in apposition thereafter. Medically, post-operative progress was complicated by two events: on the third day signs of right-sided bronchopneumonia supervened, but this responded well to replacement of penicillin by a course of tetracycline and oleandomycin (250 mg. of each six-hourly for five days); and (2) on about the sixth day facial oedema heralded the onset of heart failure, with marked dyspnoea of effort and raised jugular venous pressure. This was almost certainly due to the plasma infusions, but these were contined until the ninth day, as planned, when their cessation led to spontaneous resolution of the heart failure. The patient was discharged on the thirteenth day, full dentures constructed preoperatively being inserted prior to discharge. The A.H.G. assays were made by the method of Biggs (1957).

DISCUSSION

Except in the cases of haemophiliacs with well-cared-for sound teeth, total extractions now seem to be the method of choice in the dental management of haemophiliacs, since it is apparent that numerous sockets will heal as well as one socket with the same plasma cover, this fact stressing the economy of multiple extractions in terms of periods of hospitalization and plasma requirements. Radical reduction of the socket depths means that a smaller amount of blood clot remains, with resultant diminished risk of failure of organization and the creation of "dry" sockets. This extended surgery makes no greater demands on the infused plasma than simple extractions, and there is, in fact, a smaller total area of exposed bone for bleeding to occur from. Well-sutured gum-flaps obviate the need for splints. We are not suggesting that all cases can be treated in this way, for in piecemeal extractions apposing teeth will preclude extensive bone-trimming, and in these cases splints may still be mandatory. However, we do suggest that in cases to be rendered edentulous the above scheme is worthy of trial, since prefabricated splints can always be used if necessary. The problem of heart failure from vascular overloading is important, since the very success of daily infusion (the equivalent of concentrated plasma from 5 pints (2.8 litres) of blood was infused daily for nine days)—that is, anhaemorrhagic healing—is likely to

be conducive to such overloading. However, this could no doubt be countered by venepuncture just prior to an infusion.

SUMMARY

A case is described of total extractions in a severe haemophiliac utilizing the method of daily plasma infusions, alveolectomy, and gum-suturing, without recourse to splints. Cardiac failure due to vascular overloading resolved spontaneously at the cessation of the infusions. Further experience is desirable before this method is advocated as a standard routine in view of the variable behaviour of haemophiliacs in their response to plasma therapy.

We thank Mrs. O. Matchett for the numerous A.H.G. assays; the photographic department of St. Thomas's Hospital for the illustrations; Mr. John Hovell for his continued encouragement in the work being carried out on this subject; and Dr. K. Lupprian for his management of the anaesthetic and transfusion aspects of the operation. Numerous blood donors (45 in all) provided the much-appreciated vital factor for the entire project.

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Medical Memoranda

A Case of Thrombophlebitis Migrans

Since the time of Trousseau it has been known that thrombophlebitis may be associated with carcinomatosis. The following report is of a case of thrombophlebitis migrans which was associated with carcinoma of the colon.

CASE REPORT

A man aged 39 was first seen on June 29, 1959, complaining that about a fortnight previously he had noticed pain and stiffness in both calves. Later his right ankle had become swollen, and a thrombosed superficial vein in the right leg had been found by the physiotherapist who was treating him. He had had no injury to his legs. He also complained of shortness of breath on exertion. He had had no cough, and no pain in his chest. He had recently been rather constipated, but was otherwise completely well. He had had no previous serious illnesses.

On examination his temperature was 100.4° F. (38° C.). Both calves were tender; and in both legs segments of the long saphenous veins were thrombosed, tender, and inflamed. There were no other abnormal physical signs.

A diagnosis of thrombophlebitis migrans was made. He was admitted to hospital and treated with anticoagulants—heparin at first and then phenindione ("dindevan"). For a few days he improved: his temperature fell, and he had no further thromboses. He then developed priapism and thrombosis of the right pampiniform plexus. This was at a period when his prothrombin time was more than four times normal. On the following day he had a severe gastro-intestinal haemorrhage. During the next few weeks he ran an intermittent fever of up to 100° F. (37.8° C.), and had recurrent thromboses in the superficial veins of both arms, and in the superficial and deep veins of both legs. He had recurrent pulmonary infarcts, and a myocardial infarct. Superficial gangrene of his feet developed. During this time phenindione, phenylbutazone, and later methylprednisolone were given. On August 7 he developed the symptoms and signs of intestinal obstruction, and had a further severe intestinal haemorrhage. He was thought to have had a mesenteric thrombosis. Because of the severe bleeding anticoagulants were withdrawn, but his gangrenous feet got rapidly worse, and then he had what was presumed to be a small cerebral thrombosis involving the left posterior-inferior cerebellar territory. Heparin was therefore restarted, this time by intramuscular injection, and was continued until he died. For the next four weeks he had no thromboses and appeared to be getting slowly better. However, occult blood continued to be found in his stools. On September 8 he developed a right-sided hemiplegia, went into coma, and died.

Investigations during his lifetime did not reveal the cause of his disease. On admission his blood count was: Hb, 92%; W.B.C., 13,000 (77.5% neutrophils); platelets, 320,000; E.S.R., 12 mm. His urine contained no protein and no cells. Blood culture was negative. Serum albumin was 4 g./100 ml. and globulin 2.5 g./100 ml. An electrophoretic strip showed a moderate increase of γ-globulins. No L.E. cells were found. Serum bilirubin was normal. Fasting blood sugar was 103 mg./100 ml. Biopsy of an artery showed slight reduplication of the internal elastic lamina but was otherwise normal. Biopsy of vein showed nothing abnormal except for the thrombus it contained. Chest *x*-ray examination showed no abnormality. A barium-meal examination disclosed an irregular duodenal cap which might have been due to an ulcer. This was thought to be the cause of his bleeding.

Post-mortem examination revealed a carcinoma of the transverse colon, with metastases in glands and liver. There was a myocardial infarct, with ante-mortem thrombus overlying it, although no thrombus was demonstrable in the coronary arteries. A fibrous vegetation was found on an otherwise normal aortic valve. In the lungs were many organized thrombi in the veins and many small areas of infarction. A small area of haemorrhagic stippling was present in the left frontal lobe and in the left cerebellar peduncle. Microscopy of the tumour showed that it was an adenocarcinoma.

DISCUSSION

Trousseau (1865) first drew attention to the fact that thrombophlebitis may be a presenting sign of carcinomatosis. Mirabel (1954) counted 44 cases already reported, and there have been at least 51 reported since then (Wright, 1952; Hubay and Holden, 1954; Stein, 1955; Woolling and Shick, 1956; Anlyan *et al.*, 1956; Perlow and Daniels, 1956; Hoerr and Harper, 1957). Cases such as the one reported here with multiple thromboses associated with occult carcinoma form only a small proportion of this group, but are best considered as an extreme example of it. Thrombophlebitis may also be a presenting sign of systemic infections (Barker, 1936a), thrombo-angiitis obliterans (Buerger, 1909), blood dyscrasias (particularly polycythaemia vera) (Barker, 1936a), and collagen diseases (Miller and Daley, 1946; Fisher *et al.*, 1951), or it may be idiopathic (Barker, 1936b). It is difficult to arrive at an estimate of the frequency of the various causes. In Barker's large series 91 cases were associated with infections, 27 with carcinoma, 17 with blood dyscrasias, and 79 were idiopathic. These were found among 1,011 cases of thrombophlebitis, the rest being associated with obvious injury or disease of the veins, or some predisposing factor such as pregnancy, bed rest, or

operation. All other series are of selected cases. Hoerr and Harper (1957) reported 6 out of 46; Stein (1955) 7 out of 132. A rough estimate is that in hospital practice 3% of all cases of thrombophlebitis have carcinoma, and that this rises to 10–15% if cases with obvious local or predisposing causes are excluded.

Trousseau believed that any abdominal carcinoma was likely to present in this way. Carcinoma of the pancreas is commonly believed to be the most usual to do so. Sproul (1938) first drew attention to the pancreas. In a large post-mortem series he found that 3 out of 30 carcinomas of the head of the pancreas and 5 out of 16 carcinomas of the body and tail of the pancreas were associated with multiple venous thromboses. (Such has been the influence of this paper that Trousseau, who died of carcinoma of the stomach (Fisher *et al.*, 1951; Hubay and Holden, 1954), is nowadays sometimes said to have died of carcinoma of the pancreas (Boyd, 1958).) Kenney (1943) confirmed this. The distribution among the 96 clinical cases collected from the literature is as follows: pancreas 26, lung 24, stomach 11, undetermined 9, ovary 8, prostate 4, colon 4, gall-bladder 3, uterus 2, others 5.

This confirms the post-mortem series, though it emphasizes that many other types of carcinoma may be involved. It may merely reflect the well-known fact that carcinoma of the pancreas often remains hidden, and may not produce symptoms and signs of its own until late in the disease. How carcinoma causes thromboses is unknown. The antithrombin activity of the plasma is said to be diminished in patients with carcinoma of the body and tail of the pancreas (Innerfield *et al.*, 1951). Platelets are said to be more adhesive than normal in various carcinomas (Moolten *et al.*, 1949).

Two cases of cure of carcinoma which presented with recurrent thromboses have been claimed, both carcinomas of the ovary (Womack and Castellano, 1952; Woolling and Shick, 1956). Even if not curable the carcinoma may be operable or treatable; and when the primary has been removed recurrent thromboses may cease (Woolling and Shick, 1956). The patient's life may be greatly improved. For this reason every effort should be made to find the cause of the disease and to prevent the patient dying of the thromboses as such. A large proportion of such cases are, after all, associated with non-malignant conditions. Of Barker's (1936a) 40 cases of idiopathic recurrent thrombophlebitis (thrombophlebitis migrans), 30% had pulmonary infarcts and two of the patients died.

Full clinical examination is obviously essential. The affected veins themselves often show very little surrounding inflammation in cases with carcinoma (Cooper and Barker, 1944; Edwards, 1949; Fisher *et al.*, 1951; Hubay and Holden, 1954). Investigations should be very thorough. Carcinoma of the pancreas is notoriously difficult to diagnose, but every effort should be made to exclude it. Biopsy of an affected vein and a small artery may help to exclude Buerger's disease and collagen diseases. It is also said (Cooper and Barker, 1944) that in idiopathic cases the thrombus is well organized and the media and adventitia of the vein wall are infiltrated with lymphocytes and fibroblasts. In contrast, in cases associated with carcinoma the thrombus is simple and the vein wall normal. This was so in our case. Absence of inflammation in the vein is not, however, constant (Woolling and Shick, 1956), though it may be helpful in deciding how far to press investigations. The "idiopathic" disease can be diagnosed only by exclusion; and follow-up of such cases should be thorough, with regular examination, and chest *x*-ray examination, blood count, and examination of the stools for occult blood at intervals.

Treatment may be difficult. In our patient we had the dilemma of severe bleeding if the anticoagulation got slightly too effective, and rapidly advancing thrombosis if it was relaxed. It has actually been suggested that anticoagulants might be used as a diagnostic test to provoke gastro-intestinal bleeding and reveal a carcinoma (Perlow and Daniels, 1956). (In the present case confusion was caused by the suspected duodenal ulcer.) We found phenindione to be useless in preventing thromboses. Phenylbutazone is known to be very effective in superficial thrombophlebitis (Stein, 1955), and indeed helped our patient for a while in a dose of 1 g. intramuscularly every other day. Lack of response to this is itself a sinister sign (Stein, 1955). Steroids (which were used empirically) were of no use, and often made the situation more difficult than it need have been. Heparin was most effective. Giving it intramuscularly in doses of 10,000–15,000 units every six or eight hours, we were able to keep the clotting-time very steadily at three times normal. Thromboses did not occur for more than four weeks. Fortunately the reported difficulties of reaction and bleeding at injection sites did not occur. If heparin was given intravenously fluctuations in the clotting-time were too great and severe bleeding was caused.

Such cases as that reported here are seen so rarely that they are often difficult to deal with. It is suggested that intramuscular heparin may be the best anticoagulant, and that phenylbutazone may be useful. The incidence of underlying carcinoma in thrombophlebitis in which there is no obvious predisposing cause is such that an intensive search should be made for it in the hope that, if found, it may be treatable.

I am grateful to Dr. Kenneth Harris for permission to report his case, and for help in preparing this report.

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Reviews

A LIFELONG STUDY

Medicine a Lifelong Study. Proceedings of the Second World Conference on Medical Education, Chicago, 1959. Under the Auspices of the World Medical Association. (Pp. 816+xx. £5 5s.) New York: World Medical Association. 1961. Copies may be obtained from the Publishing Manager, British Medical Association, B.M.A. House, Tavistock Square, London W.C.1, or from booksellers.

Under the auspices of the World Medical Association the first international conference on medical education met in London in 1953 to discuss matters particularly affecting students, such as the requirements for entry to the schools, methods of selection, the curriculum proper, and the importance of social medicine. Six years later in Chicago a second conference took place, and this handsome volume is a record of its proceedings. The theme of the meeting, expressed in the title of the book, elicited some stimulating papers and debate. Although complete agreement was not reached on many of the difficult problems affecting the continued interest of doctors in the progress and development of their professional work and the basic sciences on which it rests, the labours of the participants were well worth while—despite the fears of one of the early speakers who had been discouraged by an investigation which showed that the 1953 conference had had little effect so far on the formal programmes of the schools. That is not surprising. Educational reform is inevitably slow and especially if it must be implemented by teachers accustomed to methods hallowed by tradition. Delay is not without its value; it affords time for critical assessment of the new in the light of experience and wisdom gathered in the past. In Britain the influence of the 1953 conference may be detected in the revised Recommendations of the General Medical Council and will be more apparent when the Council has completed its survey of the new curricula of the schools.

In Chicago there was almost complete unanimity that postgraduate research was essential as a stimulus to lifelong interest in medicine, and in very wise papers Professor Victor Johnson, of the Mayo Foundation, and Dr. Farquharson, of Toronto, drew attention to the value of "persistent routine"—the habit of keeping accurate and systematic clinical records and reviewing them in association with others. In this connexion graceful tributes were paid to the work of the Colleges of General Practitioners and to distinguished individuals like Dr. William Pickles. Desirable habits of persistent routine and research are best acquired in youth, and there must have been few who did not feel slightly envious of Yale in its ability to provide individual supervision of students in original work. The value of the Yale method was proved when it was shown that 42% of their graduates over a 25-year period to 1952 were engaged in teaching and no less than 60% had continued research after leaving the school. For members of the staffs of large hospitals the interesting suggestion was made that they should be afforded opportunities for refresher courses in basic sciences, because, for example, the chemistry and physics they learned as students have changed so markedly.

Difficulties in fostering research are greatest in poor and underdeveloped countries, though the opportunities in them are manifest. It was pointed out that promising young men from Asia and Africa were often sent for training and research to institutions of the advanced nations, and on return to their native lands were unable to continue original work because they were immediately confronted with great responsibilities in teaching and service in hospital departments, and because the equipment of their laboratories was so poor. For this reason it might be wise at the present time to establish only a few well-equipped centres in the poorer countries to which the best of the returning young men might be attached rather than to spread them evenly over the whole territory.

Some of the papers were a little divorced from reality—that seems inevitable in educational debates—and some were confined to factual descriptions of national methods. A welcome note of realism was sounded when it was pointed out that technique was of less importance than the personality of the teacher. The problem of specialism was not neglected, and there was serious difference of opinion; some pleaded for absorption of the specialties in the large fields of medicine and surgery, while others were equally convinced that all progress depended on concentration of interest. Anxiety was expressed about the serious consequences of divorcing the general practitioner from hospitals. It was feared that eventually the profession might be divided into high- and low-grade doctors. That in itself would be unfortunate; moreover, a profession so divided would hardly attract intelligent students if they had reason to fear that circumstance might condemn them to service among the low grade.

The World Medical Association owes a great debt to Dr. Hugh Clegg and to Mr. H. C. Papadopulo, of the *British Medical Journal*, who shared the work of editing this volume. Records of proceedings are not often interesting, but this book is an exception. I recommend it warmly to deans of medical schools, their teachers, and all interested in the education of doctors.

A. P. THOMSON.

TUDOR TIMES

Doctors and Disease in Tudor Times. By W. S. C. Copeman, F.R.C.P. (Pp. 186+xiv; illustrated. 42s.) London: Dawson's of Pall Mall. 1960.

Of late years considerable interest has been shown in the influence of the Renaissance on English medicine, surgery, and public health. Dr. Copeman's book, based upon the scholarly FitzPatrick Lectures which he delivered to the Royal College of Physicians in 1958 and 1959, is a welcome and valuable addition to the store of knowledge upon this subject. Here the author has not only obtained much factual information of historical importance, but has woven it into a consecutive narrative with literary skill. The contemporary illustrations add to the interest of the book.

The physicians, surgeons, and apothecaries of Tudor times lived, like us, in a state of transition, a time of unrest and of social upheaval after the Wars of the Roses, when old men dreamed dreams and young men saw visions. As Columbus revealed that the world was wider, men's ideas expanded and fresh knowledge was sought eagerly on Man and his environment, the structures of the human body and its diseases. In medicine, surgery, and public health it was not a time of building but of laying foundations well and truly on which a future edifice was to arise; not a time of harvest but a time in which the seeds of knowledge were sown. Under Henry VIII Linacre organized

medicine in founding the College of Physicians, and Thomas Vicary in the Barber-Surgeons' Company established surgery as a learned profession. They thus opened the doors to the light of the Renaissance, brushed aside the dogmatic teaching of the schoolmen, and taught the value of independent thought, experiment, and observation, as shown, for example, in the work of Caius on the sweating sickness and of Gilbert in *De Magnete*. In so doing they prepared the way for the epoch-making discovery of William Harvey, the investigations of John Hunter, and the triumphs of medical research which continue in the present day. In the enlightened writings of Sir Thomas More and his administration, and in the books written by Sir Thomas Elyot, Thomas Phaire, and facetious Andrew Boorde, it is possible also to trace the beginnings of social medicine and public health.

Medical practitioners and historians and medical students will see from Dr. Copeman's book how "knowledge grows from more to more," and the lay historian should not omit to read it.

ARTHUR S. MACNALTY.

PAIN IN ORTHOPAEDICS

Lectures on the Interpretation of Pain in Orthopedic Practice. By Arthur Steindler, M.D., Hon.F.R.C.S.(Eng.), Hon. F.R.S.M.(Eng.), F.A.C.S., Hon.F.I.C.S. Anatomical Dissections by Dr. Rodolfo Cosentino. (Pp. 733+xvii; illustrated. £7 8s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1959.

The late Dr. Steindler, who often visited Great Britain, had a distinguished career in orthopaedic surgery, and at the time of his death was professor emeritus in orthopaedic surgery of the University of Iowa. He was for many years interested in lecturing and had published a number of volumes of postgraduate lectures.

The particular intention of the lectures in this volume is that they should assist the clinician to arrive at an early diagnosis and so enable the progress of certain pathological conditions to be reversed. The standard of observation and discussion on clinical and pathological matters is very high, so that the book is particularly suitable for the postgraduate student. Moreover, to understand many of the lectures the reader must have considerable basic knowledge, although the author provides assistance by his illustrated descriptions of regional anatomy and neurology. He examines the meaning of pain, the syndrome of pain in many areas of the body, and the transmission of pain impulses, including referred and reflex pain, which leads to a discussion on the controversial subject of the correlation between pain and what it indicates. Later, physiological considerations give rise to a regional arrangement of descriptions of the spine and limbs. Although the topic is "pain and pain alone" the author wisely describes other symptoms essential for diagnosis, usually classifying them under a title such as "pain syndrome in the shoulder." The treatment of pain is described with particular comment on its reversibility.

The lectures cover so wide a field that the reader may at first think he has a specialized orthopaedic textbook. Pain is, however, the subject the author deals with most thoroughly, quoting James Hilton's *Rest and Pain* extensively and converting learned observations into practical usage. The mechanism of pain is not the author's theme, but rather the description of inflammation, injury, disease, and tumours which give rise to it. There is an immense amount of knowledge in this book, and careful study of such subjects as pain due to spinal conditions will repay the reader. The production and illustrations contribute to the pleasure of learning from the author.

ST. J. D. BUXTON.

APOCRINE GLANDS

The Human Apocrine Sweat Gland in Health and Disease. By Harry J. Hurley, M.D., D.Sc.(Med.), and Walter B. Shelley, M.D., Ph.D. (Pp. 138+x; illustrated. 52s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1960.

The authors of this excellent monograph noted that in recent years, although information concerning the physiology and pathology of the skin and its appendages increased rapidly, the apocrine sweat glands received but little attention. They determined to remedy this omission, and from about 1953 onwards published, sometimes with other workers, short but important papers concerning their investigations. These contributions received considerable attention here, some being noted in the *Medical Annual* and most being abstracted for the *British Journal of Dermatology*: one paper was in fact published in that journal. Hurley and Shelley have now collected much of their work, and have published it in this small but comprehensive book which will certainly take its place as a concise, authoritative report on the functions and disorders of the apocrine glands (excluding apocrine gland tumours) and on apocrine sweat. Only one major aspect is omitted, and your critic is a little baffled by this: in 1955 and 1956 Shelley, Hurley, and associates published at least three interesting papers on the ceruminous (apocrine) glands, and it is difficult to appreciate why the important observations made in these papers have been so briefly mentioned in the present volume. If another edition is required an appendix concerning the ceruminous glands would be welcome.

There is no doubt that this book will for a long period be highly regarded, and be of much service as a work of reference for physiologists and dermatologists.

R. M. B. MACKENNA.

C.S.F. IN CHILDREN

Der Liquor Cerebrospinalis im Kindesalter. By Professor Dr. H. Schönenberg. (Pp. 190+viii; illustrated. DM. 29.) Stuttgart: Georg Thieme Verlag. 1960.

Although there are already two monographs available on the cerebrospinal fluid in the German literature, the author feels that recent advances in the techniques of investigation justify a new one. These techniques include electrophoresis, paper chromatography, new methods determining proteins, phase contrast and fluorescent microscopy, new serological methods, and the detection of newly recognized pathogenic organisms.

It is claimed that the paediatrician has a particular interest in the C.S.F. and that this book fills a gap by devoting 175 pages to the problem of the C.S.F. in children. This is done in a thorough and systematic manner, starting with the methods of production of the C.S.F. and the techniques of investigating them, followed by a description of the various ways of obtaining C.S.F., and the pressure and composition of the fluid under normal circumstances. Full details of the methods of estimating the cellular, biochemical, and bacteriological contents are described. This is followed by a description of the characteristics of the C.S.F. in different diseases.

A vast amount of literature is referred to, and it is not surprising that Professor Schönenberg leans more

heavily on German than on foreign publications. One would like to have seen a more critical appraisal of many publications and the omission of much out-of-date material, which swells the size of the book unnecessarily. The printing is excellent. The illustrations are all in black-and-white, which detracts from the value of the plates.

JOHN LORBER.

CEREBRAL PALSY

The Natural History of Cerebral Palsy. By Bronson Crothers, M.D., and Richmond S. Paine, M.D. (Pp. 299+xi; illustrated. 32s. 6d.) Cambridge, Mass.: Harvard University Press. London: Oxford University Press. 1959.

The title of this book gives an idea of what the authors had specially in mind—"what we tried to understand was the way in which individual children with cerebral damage grew up under various types of management." Drawing upon their wide experience of these patients, and especially upon their detailed study and follow-up of 1,821 cases seen in private practice or admitted to a children's neurological ward between 1930 and 1950, they have prepared a volume which should be read not only by those with a special interest in cerebral palsy but by every doctor and medical ancillary worker who treats children suffering from a chronic handicap, whether of mind or body. Here they will find much that will stimulate them to reconsider the ground-plan of their aims, and some will decide that they may have concentrated too much upon details of specialized treatment.

The dominant theme of the book is one that is familiar to and accepted by paediatricians—namely, that the child is a growing and developing individual whose life must be viewed in its natural setting of home and school, and under the powerful influence of a variety of adult minds, notably the parents'. Most normal children, enjoying the affection, guidance, and example of their parents, learn a good deal by experiment; they compete with each other, and, gradually becoming more and more independent of adult control, they are on the road to self-maintenance. On the other hand, suggest Crothers and Paine, the child suffering from cerebral palsy is in the charge of parents who are likely to be perplexed and over-protective rather than confident and cheerful; his natural urge towards experiment is hindered by his disability and sometimes by the oppressive ritual of specialized and stereotyped treatment directed mainly to his motor disability. Insufficient attention is paid to the patient's changing needs as a growing individual in the family group, and the problems of adolescence are often ignored or treated in a routine fashion. The authors go into practical details to support their general conclusions, and their book is full of common sense and wisdom.

N. B. CAPON.

FUTURE OF MAN

The Future of Man. The B.B.C. Reith Lectures, 1959. By P. B. Medawar, F.R.S. (Pp. 128. 10s. 6d.) London: Methuen and Co., Ltd. 1960.

Those who heard these lectures delivered may well wish to read them. For those without training in biology or genetics they must have been difficult, if exciting, listening. Reading will clarify obscurities and reinforce recollection. Those who managed to keep pace with the lecturer will find the 24 pages of notes of great interest; they contain some amplification of the arguments and some useful references. These lectures were generally regarded as a great success; Professor Medawar has a gift, fortunately in common with many scientists to-day, for making clear to the layman scientific methods which are in themselves quite complicated.

In his first lecture, on "The Fallibility of Prediction," taking as his example the well-known fact that the ratio of birth of boys to the birth of girls increases towards the end and after a major war, he explains with great lucidity the difference between the demographic methods of secular and cohort analysis. He is always careful, too, to explain the narrow way in which he is using words in common usage and which have many broader meanings—words such as evolution, inheritance, fitness, adaptation, and congenital.

In the last lecture, on "The Future of Man," in contrasting genetic with social evolution, he demonstrates that the former is exclusively Darwinian and the latter is Lamarckian in nature. The disappearance of the old passionate battle cries allows us to think coolly about man's further evolution. He states pungently, too, that genetic evolution has often resulted in blunder and makeshift, and that in discussing social evolution one should not fall into the Victorian error of accepting for it the characteristics, true or false, of the genetic pattern. Doctors who spend an increasing amount of time correcting genetic errors and trying to mitigate the inflexibilities of homoeostasis will be grateful to him for this.

The little book has no index, so I spent a quarter of an hour trying to find the difference between polymorphic and polygenic characters. Publishers may not care, but authors, who may now and again do some serious reading, should. The proof-reading has not been a dedicated exercise. J. M. Tanner is usually J. D. Tanner and on one occasion becomes J. D. Turner.

DOUGLAS HUBBLE.

HAEMOPOIESIS

Ciba Foundation Symposium on Haemopoiesis. Cell Production and Its Regulation. Editors for the Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B., M.R.C.P., and Maeve O'Connor, B.A. (Pp. 490+xii; illustrated. 60s.) London: J. and A. Churchill Ltd. 1960.

This volume contains the proceedings of a small international conference arranged by the Ciba Foundation and attended by 27 experts under the chairmanship of Professor J. M. Yoffey. The meeting took place in February, 1960, and the editors and publishers are to be congratulated on achieving so rapid a transition from the spoken to the printed word while maintaining a high technical standard of production, with many clear and informative line diagrams and well-reproduced photomicrographs. The book is provided with both subject and author indices, the former occasionally misleading—as, for example, where references to reticulum cells are listed under "reticulocytes."

So much experimental work is reported in this volume that it is impossible to summarize it briefly. The sixteen papers given at the symposium cover in detail many aspects of the dynamics of haemopoiesis, and, since the critical discussion after each paper has been included in the book, we are presented with a lively and controversial survey of current work in this field. The nature of stem cells, the size of the stem-cell compartment, the potentialities of the lymphocyte in haemopoiesis, the rate of maturation and the frequency of mitoses in precursor cells of the lymphoid and myeloid tissues, and

the role of humoral factors in controlling the formation and release of blood cells are among the topics in which the experimental studies and the speculative arguments put forward are certain to prove stimulating to research workers engaged on these very puzzling questions.

Haematologists and cytologists cannot fail to be interested in this book: for them it is highly recommended. For physicians in general, even those with a special interest in haematology, the contents are likely to be too technical and too inconclusive to demand their attention.

F. G. J. HAYHOE.

FOR RADIOGRAPHERS AND OTHERS

Anatomy and Physiology for Radiographers. By J. E. Blewett, M.D., D.M.R., F.F.R., and A. M. Rackow, B.Sc., M.B., D.M.R.E. (Pp. 322+viii; illustrated. 37s. 6d.) London: Butterworth and Co. (Publishers) Ltd. 1960.

It is always a problem to decide how much knowledge a radiographer should have of anatomy and physiology; indeed, the same applies to other "professions allied to medicine," as they are now designated. Drs. Blewitt and Rackow, the senior consultant radiologists at King's College Hospital, have tackled the problem courageously. They are both very experienced in teaching radiographers and are well versed in the requirements of the syllabus. It might reasonably be held that anatomy is more important than physiology in applying the principles of radiography to the human body, and certainly this is the view of the authors in that most of the work concerns anatomy.

Without doubt the outstanding feature of the book is the artistry of the line drawings, of which there are nearly 150. They are strikingly good, and some are in two colours. Unfortunately they are unsigned, but, knowing that Dr. Rackow is one of the more distinguished amateur artists of our profession, one can make an intelligent guess as to who was the draughtsman. If the book is reprinted one hopes that the odd caption error here and there will be corrected, for the excellent drawings could well be converted to lantern slides for teaching purposes. Twenty-two half-tone plates are included at the end of the book. They contribute nothing to the theme, but must have raised the cost of the book quite considerably. Presumably the publishers know how far they can push up the price economically, but a far better service would have been given if another 40 or so line drawings had been added to replace the *x*-ray plates, which radiographers can see in the original every day of their lives.

The text is clear and well set out. Inevitably and rightly some simple morbid anatomy creeps in. A companion book on this subject would be useful. Thus, for example, nearly all radiographers can recognize the barium shadow of a large gastric ulcer, but few have any idea of the appearances of a pathological specimen showing an ulcer crater. Perhaps such knowledge is unnecessary and undesirable, but it is difficult to decide where to draw the line.

This book deserves success, and one hopes that the words in the title, "for radiographers," will not deter others from reading it. "An intelligent layman's guide to the structure and function of the human body" would be ponderous, but might reach a wider public. The authors have included no references. A short, well-chosen list of further reading would have been a helpful guide to the more inquiring student.

J. W. D. BULL.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received.

Miscellaneous Notes (Ninth Series). By F. Parkes Weber, M.D., F.R.C.P., F.S.A. (Pp. 8. 2s. 6d.) London: H. K. Lewis and Company Ltd. 1960.

Smoking. Its Influence on the Individual and Its Role in Social Medicine. By C. van Proosdy. With a Foreword by Richard Doll. (Pp. 319+viii. 57s. 6d.) Amsterdam, London, New York, Princeton. Elsevier Publishing Company. 1960.

Die Mikrozirkulation in der Nasenschleimhaut. By Professor Dr. H. H. Naumann. (Pp. 96; illustrated. DM. 16.75.) Stuttgart: Georg Thieme Verlag. 1961.

Pratique Obstétricale. Third edition. By B. Jamain. (Pp. 277. 20 NF.) Paris: L'Expansion Scientifique Française. 1960.

Report of a Symposium on the Provision of Animals for Cancer Research held at the Royal Society of Medicine on 23rd May, 1960. Volume 9. (Pp. 116; illustrated. 12s. 6d.) Carshalton, Surrey: Laboratory Animals Centre, M.R.C. Laboratories, Woodmansterne Road. 1961.

Infectious Diseases of Children. By Saul Krugman, M.D., and Robert Ward, M.D. Second edition. (Pp. 398; illustrated. 97s. 6d.) St. Louis: The C.V. Mosby Company. London: Henry Kimpton. 1960.

Respiration Physiologic. Principles and their Clinical Applications. By P. H. Rossier, A. A. Bühlmann, K. Wiesinger. Edited and Translated from the German Edition by Peter C. Luchsinger, M.D., and Kenneth M. Moser, M.D. (Pp. 505; illustrated. £5 18s.) St. Louis: The C.V. Mosby Company. London: Henry Kimpton. 1960.

Management of Hypertensive Diseases. By Joseph C. Edwards, A.B., M.D., F.A.C.P., F.A.C.S. (Pp. 439; illustrated. £5 12s. 6d.) St. Louis: The C.V. Mosby Company. London: Henry Kimpton. 1960.

Cholera. Its Pathology and Pathogenesis. By S. N. De, M.B., D.T.M.(Calcutta), Ph.D.(London). (Pp. 141+xi; illustrated. 25s.) Edinburgh and London: Oliver and Boyd. 1961.

The Psychology of Crime. By David Abrahamsen, M.D. (Pp. 357+ix. 48s.) New York: Columbia University Press. 1960.

Teaching the Mentally Retarded Child. By Natalie Perry. (Pp. 282+xii; illustrated. 48s.) New York: Columbia University Press. 1960.

Clinical Orthopaedics. By Anthony F. DePalma, editor-in-chief. Guest editor: Marshall R. Urist, M.D. Number 17. (Pp. 387+xi; illustrated. 60s.) Philadelphia and Montreal: J. B. Lippincott Company. 1960.

Aggiornamenti in Chemio Antibiotico Terapie. (Pp. 311. No price.) Milan: Edizioni Deca. 1960.

Surgical Errors and Safeguards. By Max Thorek, M.D., LL.D., Sc.D., F.I.C.S., F.B.C.S., F.P.C.S.(Hon.), D.C.M., F.R.S.M. Fifth edition. (Pp. 652+xvi; illustrated. **£10.**) London: Pitman Medical Publishing Co., Ltd. 1961.

Practical Heredity with Drosophila. By Gordon Haskell, Ph.D. (Pp. 124+xii; illustrated. 10s. 6d.) Edinburgh and London: Oliver and Boyd. 1961.

Kompendium der Psychiatrie. Klinik und Therapie für Studierende und Ärzte. By Priv. Doz. med. et phil. Th. Spoerri. (Pp. 132. Sw. Fr. 13.) Basle, New York: Verlag S. Karger. 1961.

Psychoanalytic Concepts of Depression. By Myer Mendelson, M.D. (Pp. 170+xii. No price.) Springfield, Illinois: Charles C. Thomas. 1961.

Chemistry of Heart Failure. By William C. Holland, M.D., and Richard L. Klein, Ph.D. (Pp. 116+xiii; illustrated. 44s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications Ltd. 1961.

Die kindlichen Entwicklung. Physiologie und Pathologie. By Prof. Dr. med. Erwin Thomas. (Pp. 80+viii. DM. 17.40.) Stuttgart: Ferdinand Enke Verlag. 1961.

Valiant Companions. Helen Keller and Anne Sullivan. By Helen E. Waite. (Pp. 190. 15s.) London: Hodder and Stoughton Limited. 1961.

The Mental Health Act, 1959. By S. R. Speller, O.B.E., LL.B. (Pp. 138+xiii. 13s. 6d.) London: Institute of Hospital Administrators, 75 Portland Place, W.1.

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FARMER'S LUNG AGAIN

Owing to the unusually wet autumn and winter the Ministry of Agriculture has recently advised farmers to wear an efficient dust mask when handling mouldy hay or corn, and warned them of the risk of developing farmer's lung. It was after a wet summer in 1931 that J. M. Campbell[1] first described the clinical picture of this disease. When crops are harvested in rainy weather and stored in closed barns or silos, the forking out of mouldy bales of hay, the threshing of poor-quality grain, or the sweeping out of closed barns may produce clouds of white, irritant dust containing fine vegetable matter laden with fungus spores. Inhalation of this dust by a previously sensitized person may cause an alarming lung reaction. Identical reactions may follow the handling of mouldy sugar-cane pulp (bagassosis),[2] stripping fungus-infected bark from maple trees (coniosporiosis),[3] working with mouldy cotton (weaver's cough),[4] or changing mushroom compost.[5] Silo-filler's disease, an acute pulmonary oedema with obliterative bronchiolitis, is due to inhalation of nitrogen dioxide and is a separate clinical entity.

After a few minor attacks of breathlessness the onset is usually abrupt. Exposure to the dust is followed by extreme dyspnoea, which may continue to increase for some days and result in total incapacity. Rigors may occur, and the clinical picture is completed by a dry, irritant cough, fever, sweating, and loss of weight. Haemoptysis is unusual, but has been reported in two recent American series[6 7]; pleural pain is rare; these two points help in distinguishing farmer's lung from pneumonia. There is no true wheezing or bronchospasm, and this important finding rules out an asthmatic basis, though asthmatic farmers may often have attacks induced by contact with the mouldy dust.[8] The main physical signs are cyanosis and moist sounds throughout the lung fields. Signs of consolidation are absent.

Over a period of three to six weeks spontaneous resolution occurs, but residual breathlessness on exertion may persist for many months, and exposure again to the dust will lead to a recurrence of symptoms. Over the years this may cause permanent disability, with progressive pulmonary fibrosis and eventual right heart failure.[5 9] Farmers may be compelled to change their occupation because of recurring attacks, and the economic implications of the disease can be serious.

Laboratory findings help little in establishing a diagnosis. There may be mild polycythaemia, slight leucocytosis without distinct eosinophilia, and a normal or slightly raised erythrocyte sedimentation rate. Culture of the sputum may yield a mixed fungal growth comparable with the flora of the barn dust, and *Candida* infection has been reported.[10] Skin tests for sensitivity to fungi and to histoplasma are usually negative, and serum antibodies to aspergilli and penicillia have not, so far, been detected. The Mantoux test is often negative. Studies of pulmonary function in the acute attack show a reduction in pulmonary diffusing capacity and diminution of the vital capacity and maximum breathing capacity.[7] Lung biopsy has been carried out by R. C. Frank,[6] H. A. Dickie and J. Rankin,[7] and W. P. Baldus and J. B. Peter.[11] In each case the main lesion found was a focal non-caseating granuloma surrounded by giant cells and accompanied by an interstitial lymphocytic and histiocytic infiltration.

It is on the radiological appearance that the diagnosis usually depends. In the mild case the changes may be minimal, but the established case shows a ground-glass opacity extending to the periphery of the lung fields. A fine reticulation may be superimposed, together with a typical granular mottling. The granularity is finer than the "snowstorm" of miliary tuberculosis, the densities being a millimetre or less in diameter and well described as a "sandstorm." In some cases resem-

[1] Campbell, J. M., *Brit. med. J.*, 1932, **2**, 1143.
[2] Sodeman, W. A., *Dis. Chest*, 1949, **15**, 162.
[3] Towey, J. W., Sweany, H. C., and Huron, W. H., *J. Amer. med. Ass.* 1932, **99**, 453.
[4] Caminita, B. H., Baum, W. F., Neal, P. A., and Schneiter, R., *Publ. Hlth Bull. (Wash.)*, 1947, No. 297.
[5] Bringhurst, L. S., Byrne, R. N., and Gershon-Cohen, J., *J. Amer. med. Ass.*, 1959, **171**, 15.
[6] Frank, R. C., *Amer. J. Roentgenol.*, 1958, **79**, 189.
[7] Dickie, H. A., and Rankin, J., *J. Amer. med. Ass.*, 1958, **167**, 1069.
[8] Studdert, T. C., *Brit. med. J.*, 1953, **1**, 1305.
[9] Fuller, C. J., *Thorax*, 1953, **8**, 59.
[10] Törnell, E., *Acta med. scand.*, 1946, **125**, 212.
[11] Baldus, W. P., and Peter, J. B., *New Engl. J. Med.*, 1960, **262**, 700.
[12] Fawcitt, R., *Brit. J. Radiol.*, 1936, **9**, 172.
[13] Williams, D. I., and Mulhall, P. P., *Brit. med. J.*, 1956, **2**, 1216.
[14] Joyce, J. C., and Kneafsey, D., *J. Irish med. Ass.*, 1955, **37**, 313.
[15] Quinlan, J. J., and Hiltz, J. E., *Canad. med. Ass. J.*, 1959, **80**, 261.
[16] Duncan, J. T., *Brit. med. J.*, 1945, **2**, 715.
[17] Zettergren, L., *Acta Soc. Med. upsalien*, 1950, **55**, 257.
[18] Horejsi, M., *et al.*, *Thorax*, 1960, **15**, 122.

blance to sarcoid is striking, but hilar adenopathy is absent. Radiological clearing lags behind clinical improvement, and, though reversion to a normal picture is the rule after a single attack, focal emphysema and pulmonary fibrosis may follow repeated exposure.

Treatment in the acute attack is hard to assess, as the natural history of the disease is one of spontaneous remission. Iodides and antihistamines are of little value, and wide-spectrum antibiotics are contraindicated, for there is a risk of producing aspergillosis or moniliasis if the natural bacterial flora is suppressed. Steroids have a strong claim for consideration, and may induce a dramatic remission in the severe case. There may also be a place for steroid prophylaxis during the spring months, when the risks of re-exposure are greatest, in an attempt to prevent or delay pulmonary fibrosis in a sensitized farmer who is unable to change his occupation.

The geographical distribution of farmer's lung is interesting. Until recently reports were confined to north-western[1 8 12] and south-western[9] England and Sweden.[10] Small series have since been reported from Wales,[13] Ireland,[14] Canada,[15] and New England,[11] and in 1958 two reports of relatively large numbers of cases were published from Wisconsin.[6 7] A disease which was first described in the hill farms of England with storage of hay in small, ill-ventilated barns is now found to be common in the dairy belt of America. The reason appears to be that there also cattle feed is stored in air-tight barns and silos to protect it from the severe winter weather, and the farmer forking out the hay is subjected to a very high concentration of mouldy dust.[7]

J. T. Duncan[16] in 1945 first postulated that farmer's lung resembled byssinosis rather than a true mycosis, and considered that the lung lesion was due to irritation by fine vegetable fibres. T. C. Studdert[8] and C. J. Fuller[9] regarded the reaction as a sensitization to the fungus spores, and Fuller drew attention to the experimental work of L. Zettergren[17] who produced granulomata in rabbits' lungs both with sterile and with monilia-contaminated barn dust. These changes are very similar to the findings at lung biopsy in cases of farmer's lung, and bear at least a superficial resemblance to sarcoid granulomata. It is perhaps significant that many cases of farmer's lung have a negative Mantoux reaction. The relative importance of the fungus spores and the vegetable dust in the production of lesions is still uncertain, but it now appears that both may be necessary. M. Horejsi and his colleagues[18] have described an outbreak of acute respiratory disease in a group of workers in a Czechoslovakian factory in which citric acid is produced by the fermentation of molasses with aspergilli. These men are exposed to a dust of almost pure fungus spores (both aspergilli and contaminant penicillia) without any added vegetable matter. They develop acute respiratory symptoms, sometimes asthmatic and sometimes resembling the acute stage of farmer's lung. Skin and serological tests show sensitization to aspergilli and penicillia, but granulomatous lung lesions do not occur. The inhalation of pure vegetable dust in cotton mills produces an acute reaction, particularly when there has been a period of freedom from exposure ("Monday fever"), but again the radiological picture of farmer's lung is lacking. It is only when dust containing mouldy vegetable material is inhaled by a sensitized individual that the typical granulomatous lesions occur, and evaluation of the relative importance of different fractions of this dust must await further work.

MANAGEMENT OF CASES OF ABORTION

Abortion is the most common complication of pregnancy. It brings 10% to 15% to an end within the first twelve weeks and a smaller number in the middle trimester. Moreover, it carries the risk of serious illness or death, besides being, in most cases, a very distressing experience. In England and Wales it accounted for at least 141 maternal deaths in the years 1955–7 and was third in the list of causes of deaths due to pregnancy during those years.[1] The correct management of these patients presents problems to general practitioners and to hospital medical and administrative staffs.

The experience of a 40-bed abortion unit with its own operating-theatre at Walton Hospital, Liverpool, is admirably presented this week in the *Journal* (p. 705) by Mr. W. S. E. Perera. The lessons to be learned merit attention. When hospital treatment is required, as it is in a minority of cases, it needs to be prompt and efficient. This is where the special unit makes its greatest contribution. Built, equipped, and staffed for the purpose of treating abortion, it can do this efficiently and economically. The results reported are impressive: a total of 8,347 patients were treated from 1951 to 1959, with only 5 deaths

[1] Ministry of Health, *Report on Confidential Enquiries into Maternal Deaths in England and Wales, 1955-1957*, H.M.S.O., London, p. 103.
[8] Shirodkar, V. N., *Antiseptic*, 1955, **52**, 299.
[9] Green-Armytage, V. B., and Browne, J. C. McC., *Brit. med. J.*, 1957, **2**, 128.
[4] Scott, J. S., ibid., 1955, **2**, 290.
[5] Loudon, J. D. O., *J. Obstet. Gynaec. Brit. Emp.*, 1959, **66**, 277.

(0.06%). When delays are inevitable, and they often must be, between the emergency treatment given in the patient's home by the general practitioner and the admission to hospital many miles away, a flying-squad service can be life-saving and perhaps merits more use in the management of abortion. Furthermore, when a hospital bed is required, it should be readily available, yet nationally there is much to be desired in the provision of beds for this serious complication of pregnancy.

As always, accurate diagnosis is important, and, while there are difficult borderline cases in which a second opinion can be helpful, a useful guide to clinical practice is as follows. Firstly, slight painless bleeding when there is reason to believe that the patient is pregnant should be regarded as a sign of threatened abortion. The less interference at this stage the greater the chance of the pregnancy continuing. Bed rest and mental peace, which reassurance and sedatives can help to provide, are the essentials of treatment. Hormones are not indicated. In most cases bleeding stops within a few hours and is followed by a brown discharge lasting for several days. This is not a cause for anxiety, and if the patient is warned in advance of its probable occurrence she will be less worried. Bright bleeding persisting for 24 to 48 hours, or its recurrence after this interval, indicates the need for further investigation. The cervix should be gently palpated and exposed for visual examination. Polypi and even carcinoma of the cervix can be missed unless this is done. Secondly, when slight bleeding is associated with pain in the lower abdomen, extra-uterine pregnancy should be considered. Thirdly, more severe bleeding is usually but not always associated with cervical effacement and dilatation, and when products of conception are palpated within the cervical canal abortion is inevitable. An exception is when cervical incompetence, as described by V. N. Shirodkar[2] and others,[3] causes abortion, usually in the middle trimester. Bleeding is not a feature of these cases and there may be none. Timely recognition of the incompetence, with suture of the cervix before the membranes rupture, will enable many of these pregnancies to continue to term.

Efficient emergency treatment for inevitable abortion with severe haemorrhage is the administration of ergometrine 0.5 mg. intravenously or intramuscularly. If severe bleeding persists, it usually indicates that foetal products are trapped in the cervical canal. Their removal with the finger is easy and effective in preventing further blood loss. A flying-squad service is best equipped to handle cases of this severity after the emergency measures outlined above have been adopted. Mr. Perera is opposed to the intravenous administration of dextran and refers to failures of blood coagulation after its use as reported by J. S. Scott[4] and others. He advocates the use of "small pool" plasma in an emergency if blood is not available.

Generally, an empty uterus will not bleed, and if abortion is complete loss of blood will be minimal. Conversely, if bleeding persists or recurs there are almost certainly retained products of conception. It is not easy to tell accurately that an abortion is complete by examination of the expelled ovum, and when in doubt it is wiser to assume that products are retained. Incomplete abortion is associated with the dangers of haemorrhage, infection, and infertility. In the Liverpool series 62% of admissions were diagnosed as having an inevitable or incomplete abortion. Surgical evacuation of the uterus with a sharp curette and without post-operative packing was the treatment favoured. Blood transfusion was given to 11.6% of all patients admitted, either as an immediate resuscitative measure or in the initial treatment of severe anaemia. In the treatment of missed abortion encouraging results are reported from giving intravenous infusions of oxytocin in high concentration as advised by J. D. O. Loudon.[5] The concentration suggested is initially 10 units of oxytocin per pint (540 ml.) of dextrose solution at a rate of 25 drops per minute and gradually increasing the concentration to 100 units per pint.

When abortion is complicated by infection the patient should be transferred to hospital with a minimum of delay. Cervical swabs are taken for culture and sensitivity tests, but treatment is begun with penicillin and streptomycin Broad-spectrum antibiotics should be kept in reserve for those patients who fail to respond to this treatment or for those who are shown by the sensitivity tests to need them. If haemorrhage is severe, infection must be ignored and the uterus gently evacuated. Perforation is most dangerous, and pre-operative administration of ergometrine will make evacuation safer. In most cases of septic abortion haemorrhage is not a clinical feature, and evacuation can be delayed until the infection is controlled.

Biological pregnancy tests are notoriously misleading in the differential diagnosis of abortion. A negative test is not uncommon in a pregnancy which progresses uneventfully to term, and conversely a positive test can be obtained many weeks and even months after an abortion has occurred if chorionic elements are retained *in utero*. No patient should be

discharged after treatment without an attempt being made to discover the cause of the abortion. If this is done, timely advice can be the means of preventing future trouble.

GAS GANGRENE FROM ADRENALINE

It has long been known that a particular though remote risk of gas gangrene is involved in administering adrenaline, because the vasoconstriction reduces the oxygen tension at the site of injection to a level permitting the germination of anaerobic spores. These accidents are peculiarly tragic, because the victim may be young and suffering from nothing more serious than asthma; the spread of the infection is rapid and its nature is often unrecognized until too late. The earlier literature of this subject, which is almost exclusively Continental, is reviewed in a Medical Research Council Memorandum[1] as part of an argument that spirit is incapable of sterilizing syringes. Not only is it unable to kill spores, but those of *Clostridium welchii*, the organism invariably found in this infection, may actually be contained in it. Of recent years a few cases have been reported in the English literature; it seems highly probable that others have occurred but publication has been thought unnecessary or inadvisable. E. V. Cooper[2] reported one, and did a series of guinea-pig inoculations with different numbers of this strain of *Cl. welchii* with and without adrenaline which showed that the latter reduced the minimum infecting dose of bacteria 10,000-fold. D. G. Evans, A. A. Miles, and J. S. F. Niven[3] extended these observations and found a difference of 100,000-fold for *Cl. welchii* and *Cl. septicum* but none for *Cl. tetani* and *Cl. histolyticum*. Infection by streptococci and other vegetative and aerobic bacteria was also enhanced somewhat, presumably because vasoconstriction also interferes with the diapedesis of leucocytes.

Four further examples of this infection, three of them fatal, have also been reported from Australia, one several years ago by J. I. Tonge[4] and a group of three recently by V. Marshall and P. Sims.[5] The source of infection was not traced in any of them, but the cases present two features which may have a bearing on its pathogenesis. All four were given an intramuscular injection of adrenaline in oil. As a sequel to the second paper, R. F. Bishop and Marshall[6] report experiments in guinea-pigs to determine whether oily adrenaline has any more effect than aqueous in enhancing *Cl. welchii* infection, and they found that it had not. Marshall and Sims nevertheless conclude that, since the oil preparation must be injected intramuscularly, and since the risk of gas gangrene is greater after injection by this route, this method of administration is "an unjustifiable risk." The second significant feature is the site of injection. Tonge's patient, a girl of 15 with asthma, was injected in the thigh, and 2 of Marshall and Sims's patients, men of 45 and 52 with urticaria and asthma respectively, received it in the buttock. The skin to a considerable distance from the anus is liable to be contaminated with intestinal bacteria. *Cl. welchii* is a normal inhabitant of the human bowel, and its spores are not destroyed by any method of skin disinfection; hence the infection in these patients could well have been autogenous.

If this possibility is granted, it may be concluded that adrenaline should never be injected in this area. There is no reason why it should be; the gluteal muscles are only really needed for repeated injections, such as those of penicillin, which involve no risk of this kind. We may also be well advised to accept Marshall and Sims's conclusion that the injection should not be intramuscular. Indeed, some re-thinking about the site of injection not only of medicaments but of immunizing agents might not be out of place. Muscle is more vascular, permitting more rapid absorption if that is desired, and perhaps more tolerant of some types of foreign material, which are more readily dispersed and disposed of. But rapid absorption and dispersal are not always what is wanted, and to set against these advantages, if they are, there is interference with the function of an active organ. Is not subcutaneous connective tissue a better depot for many of these substances?

[1] The Sterilization, Use, and Care of Syringes, *M.R.C. Memorandum No. 15*, 1955. H.M.S.O., London.
[2] Cooper, E. V., *Lancet*, 1946, 1, 459.
[3] Evans, D. G., Miles, A. A., and Niven, J. S. F., *Brit. J. exp. Path.*, 1948, 29, 20.
[4] Tonge, J. I., *Med. J. Aust.*, 1957, 2, 936.
[5] Marshall, V., and Sims, P., ibid., 1960, 2, 653.
[6] Bishop, R. F., and Marshall, V., ibid., 1960, 2, 656.

CORONARY THROMBOSIS IN DOCTORS

The observation that coronary thrombosis is more common among doctors than among other men of comparable age has an obvious appeal as a starting place for research.[1 2] It is, of course, possible that the excess is spurious. Thirty years ago, when the diagnosis of coronary thrombosis required a certain amount of diagnostic sophistication, it was reasonable to believe that this might be so, and it may still be that minor symptoms of coronary thrombosis are diagnosed more readily among doctors than among their patients. But the disease is now so much in the medical eye that it seems more likely to be overdiagnosed than underdiagnosed as a cause of death among the general public, and

there is no reason to suppose that there is now any unusual tendency to certify it as a cause of death among doctors.

Not all doctors appear to be equally at risk. Nearly nine years ago J. N. Morris and his colleagues[3] reported that the risk was higher among general practitioners. They obtained data from the records of an insurance company and found that among men aged 40–59 years the incidence of first attacks of coronary thrombosis was twice as high for general practitioners (7.1 per 1,000) as for other doctors (3.3 per 1,000), and slightly higher for other doctors than for a miscellaneous group of men in other occupations (2.5 per 1,000). Similar, but somewhat smaller, differences were observed between coronary death rates. More data have now been reported from the U.S.A.[4] H. I. Russek sent questionaries to 1,000 general practitioners, selected from the pages of the *Directory of the American Academy of General Practitioners*, and to 3,000 anaesthetists, dermatologists, and pathologists selected from the *Directory of Medical Specialists*. Each doctor was asked to say whether he had cardiovascular disease and, if so, the age at onset and whether it was hypertensive disease, angina pectoris, or myocardial infarction. Replies were received from approximately 65% in each of the four groups. Analysis of the replies from male doctors aged 40–69 years showed that the incidence of coronary heart disease—standardized for age—was approximately equal among general practitioners (10.6%) and anaesthetists (10.4%), and was substantially less among pathologists (3.3%). In contrast, there was little difference in the standardized incidence of hypertension — general practitioners 5.4%, anaesthetists 4.5%, pathologists 6.1%, and dermatologists 5.5%. In Russek's opinion the difference in the reported incidence of coronary heart disease can be accounted for most readily by differences in the amount of emotional stress produced by the routine demands of professional work. Eight other physicians were asked to grade the four specialties in order of the "stressfulness" of the occupation, and the almost unanimous opinion was that general practice was the most "stressful" and that anaesthetics was a close second. The characterization of anaesthetics as a "stressful" occupation may perhaps surprise some British physicians, but differences of opinion of this type are inevitable in the absence of an objective and quantitative measure. It is, however, more important to ask whether the differences observed are real and, if so, whether there are any other possible explanations for them. Russek considers that it was reasonable to base the diagnosis on the response to a questionary, as physicians are well qualified to give information about their medical history; but it does not necessarily follow that the criteria of diagnosis adopted by each of the groups would have been the same. It would, for example, be reasonable to suppose that pathologists were a little more chary of making an ante-mortem diagnosis than their colleagues in general practice. On the other hand, the results agree well with those of Morris and his colleagues, and they probably reflect real differences in the incidence of the disease among different sections of the profession.

On present evidence, the factors which are most likely to affect the incidence of coronary disease are heredity, diet, physical activity, cigarette smoking, and emotional stress. Russek's results can hardly be explained by differences in heredity, and differences in physical activity would surely tend to reduce the incidence among general practitioners in comparison with their more sedentary colleagues. The other three factors are more difficult to separate. Several studies have shown that serum cholesterol levels are higher in cigarette smokers than in non-smokers,[5 6] and B. Bronte-Stewart found that in South Africa among both European and Cape Coloured men there was an even greater difference in the proportions of the cholesterol found in the β-lipoprotein fraction.[7] Other workers have found evidence of a relationship between cigarette smoking, personality, and nervous tension.[8] The concept that differences in the mental tensions of professional work are responsible for the differences in incidence is attractive; but on present knowledge it would be unwise to assume that this was the primary cause. According to Morris and his colleagues the evidence for a higher incidence among general practitioners was limited to the period 1947–50. Less accurate data were available for the previous six years, but such evidence as there was suggested that, at that time, the incidence was the same among both groups of doctors and that the level was no higher than that recorded among other doctors in the later period. It may also be noted that in Britain the high coronary mortality among doctors is shared by clergymen, but not by judges and barristers.[2]

Comparison of the morbidity experience of different sections of the profession promises to be a useful method of studying the causes of coronary thrombosis; but until there is a more objective method of measuring degrees of mental stress it would seem preferable to keep an open mind about the cause of the differences, and to try to obtain a more detailed definition of the groups that suffer the highest risk.

[1] Dublin, L. I., and Spiegelman, M., *J. Amer. med. Ass.*, 1948, **137**, 1519.
[2] *The Registrar General's Decennial Supplement, England and Wales 1951. Occupational Mortality*, Parts I and II, 1954 and 1957. H.M.S.O., London.
[3] Morris, J. N., Heady, J. A., and Barley, R. G., *Brit. med. J.*, 1952, **1**, 503.
[4] Russek, H. I., *Amer. J. Med. Sci.*, 1960, **240**, 711.
[5] Karvonen, M., Orma, E., Keys, A., Fidanza, F., and Brozek, J., *Lancet*, 1959, **1**, 492.
[6] Thomas, C. B., *J. chron. Dis.*, 1958, **7**, 198.
[7] Bronte-Stewart, B., *Brit. med. J.*, 1961, **1**, 379.
[8] Eysenck, E. J., Tarrant, M., Woolf, M., and England, L., ibid., 1960, **1**, 1456.

ACHIEVEMENT AT KARIBA

The construction of the Kariba Dam, on a site in a remote area inhabited mainly by game and tsetse flies, and in face of almost unprecedented difficulties, was a magnificent achievement made possible by the success of the health service created for the project. Dr. M. H. Webster and his team deserve the warmest congratulations on its success.

Control of malaria, which was highly endemic locally, was the first measure undertaken. The interior walls of houses were sprayed regularly with residual insecticide,

reinforced at first by applying oil to mosquito breeding places. The use of prophylactic antimalarials by European and African staff was obligatory. Only two Europeans died from malaria; both lived outside the controlled area and neglected chemoprophylaxis. Rhodesian sleeping-sickness also was present in the sparse local population and tsetse flies were very dense near by. Air-spraying of the fly's dry-season habitat together with block spraying of the living area, a total of 15 square miles (39 sq. km.), controlled tsetse for a year, by which time the growth of the project had driven away the game animals necessary for its survival. Reintroduction on vehicles was prevented by spraying chambers, and, on one busy road, by maintaining an insecticidal fog in a cutting. Only one case of trypanosomiasis occurred, a symptomless infection of unknown origin in an African.

Probably the greatest menace was the housefly. The high standard of sanitation necessary for its control was difficult to achieve owing to the very rapid expansion of the labour force. At first accommodation was primitive, but eventually townships for Europeans and Africans were constructed of concrete block buildings. The Africans were provided with communal ablution facilities and water-borne sanitation. Temporary quarters vacated were immediately destroyed to prevent occupation, and new houses were kept vacant until sanitary services were ready. An attendant was provided to instruct people in the use of water closets, and to keep them clean. At working sites chemical closets were provided. Water supply from the river was complicated by the variation of some 70 ft. (21 m.) in its level, so that the intake pumps had to be mounted on rails on a ramp.

Causes of morbidity were numerous. Gastro-intestinal infections were rarely severe; all labour was inoculated against typhoid, paratyphoid, and tetanus. Heat cramp and exhaustion were common, especially among Italians, who, in place of their customary wine, drank beer rather than the saline drinks provided. Skin diseases were common, resulting from sweating and dust, which contained much irritating micaceous material. Dust also caused respiratory-tract infection and eye complaints. Schistosomiasis and hookworm infections were treated on recruitment and gave little trouble. Salk-type vaccine was given to all European children after two had developed poliomyelitis. Injuries were the predominant cause of major and minor disability, and accidents were responsible for two-thirds of European and one-third of African deaths. A first-aid station was provided at the beginning, but later a hospital was erected, capable of dealing with almost every type of case. Hospital charges were borne by the employers.

This comprehensive health service cost less than £250,000 over a period of four years—that is, about 0.3% of the total expenditure on the Kariba scheme. In view of the high health standards maintained during construction the investment must be regarded as having paid handsomely. The description of these medical operations[1] will prove of great value to those planning large engineering projects in a tropical environment.

[1] Webster, M. H., *Cent. Afr. J. Med.*, 1960, **6**, Supplement pp. 1-36.

NEW VIRUSES: ORDER OR CHAOS?

New viruses are being discovered in large numbers. This has come about particularly because of the widespread use of tissue-culture techniques. Some of the "new" viruses may prove to have little importance as causes of disease in man. Others may well be concerned with one or other of the mass of undifferentiated upper respiratory infections. Some of these new viruses are adenoviruses, others myxoviruses allied to influenza or the para-influenza viruses; others again resemble E.C.H.O. viruses, some of which are able to cause trouble in the upper respiratory tract. The common-cold viruses isolated at Salisbury[2 3] seem to be in this group.

There is a danger that confusion may arise, for the same new viruses may be described by workers in different laboratories under different names. Something needs to be done to prevent such chaos. The World Health Organization is accordingly proposing to set up virus reference laboratories in different countries. One such centre, to deal with enteroviruses, has been set up in the U.S.A. under Dr. J. L. Melnick at Baylord University, Houston, Texas; and another, for viruses causing respiratory infections, in Great Britain under Sir Christopher Andrewes, F.R.S., at the Common Cold Research Unit at Salisbury. These laboratories will have to prepare diagnostic sera with which to identify viruses submitted to them, and these, if they prove to be new, will have to be given appropriate names or serial numbers. The laboratories cannot undertake to identify any virus isolated from any virus infection; their function will be rather that of a court of appeal, to be used when with the best facilities available in a country's laboratories a virus cannot be identified. There will need to be free exchange of information and strains among W.H.O.'s present or future reference laboratories; and, since the dividing line between E.C.H.O. and other enteroviruses on the one hand and common cold viruses on the other is at present blurred, the enterovirus and respiratory-virus centres will have to work along together.

A series of respiratory-virus reference laboratories may well be based on the existing network of W.H.O. influenza laboratories. Indeed, it may be found that novel respiratory viruses appear and then spread from country to country just as new influenza strains do. The laboratory now set up at Salisbury should have an important part to play in furthering knowledge about respiratory infections.

[2] Tyrrell, D. A. J., Bynoe, M. L., Hitchcock, G., Pereira, H. G., and Andrewes, C. H., *Lancet*, 1960, **1**, 235.
[3] —— —— *Brit. med. J.*, 1961, **1**, 393.

We record with regret the death on March 6 of Lord Stopford of Fallowfield, formerly professor of anatomy, professor of experimental neurology, dean of the medical school, and vice-chancellor of the University of Manchester.

British Medical Association

ANNUAL MEETING AND BIENNIAL CONFERENCE OF THE NEW ZEALAND BRANCH, AUCKLAND, 1961

SUMMARY OF PROCEEDINGS

SECTION OF PATHOLOGY

Tuesday, February 7 (morning)

Studies of Human Warts

With Dr. C. J. C. BRITTON (London) in the chair, Professor J. A. R. MILES (Dunedin) read a paper describing elecron-microscope studies of thin sections of human warts, which he classified into two separate categories—inclusion warts, which were found on the soles of the feet and under the nail, and common warts, which appeared mainly on the hands. Histological examination of sections of the former showed great variations in the size and organization of cells and in the size, shape, and staining properties of the nuclei. No gross histological abnormality was demonstrable in common warts.

Thin sections stained with osmic acid revealed inclusion bodies containing large numbers of virus particles in the keratinized layer. In sections of the stratum spinosum of inclusion warts the cytoplasm was not normal, and there were a number of homogeneous cytoplasmic bodies which were not true inclusions of virus origin but areas of aberrant keratinization which were possibly a response to infection by the virus. Professor Miles had not succeeded in demonstrating virus particles in the deeper layers of warts. When the particles were examined at a higher magnification it was found that their average diameter was about 38 mμ in the banal wart and about 50–60 mμ in the inclusion type.

It seemed, therefore, that there were two histologically distinct lesions produced by viruses with different particle sizes. Professor Miles had investigated preparations made from pools of warts of mixed histological type, and found that both large and small virus particles were present. He then made a purified preparation of single inclusion warts which confirmed his earlier findings and showed close-packed orientated groups of the larger particles. The small tissue fragments from the common wart yielded less satisfactory preparations but appeared to support his previous observations.

When warts of characteristic histology were transmitted by intradermal injection into the skin of the back of the hand of human volunteers they bred true and presented the same histological picture as that of the source material. Therefore, on the basis of the histological findings, the clinical features, and the transmission experiments it was concluded that there were two separate aetiological types of wart.

Fatal and Chronic Hepatitis

Dr. D. T. STEWART (Christchurch) then read a paper describing some biochemical and histological findings in fatal and chronic hepatitis. He said that in four fatal cases of hepatitis in children the results of sero-flocculation tests in one were negative, in two weakly positive, and in the fourth positive. Transaminase was increased in amount and prothrombin concentration decreased in two out of three cases examined. He concluded that it was necessary to be cautious in excluding severe, possibly fatal, hepatitis just because the flocculation tests were little affected.

Dr. C. J. C. BRITTON (London) opened the discussion and said that transaminase estimation and flocculation tests were most valuable in the early stages of hepatitis, but the findings from them often returned to within normal limits in the later stages. Dr. G. V. RUDD (Sydney) had found that the transaminase value, which had become normal, increased again on relapse.

Refractory Hypochromic Anaemia

Under the chairmanship of Dr. J. O. MERCER (Wellington), Dr. C. J. C. BRITTON (London) gave a short review of the refractory hypochromic anaemias, with special reference to refractory sideroblastic anaemia. They were considered to be due to: (1) failure of absorption of iron, (2) deficiency of internal secretions, (3) deficiency of vitamins, (4) deficiency of protein, (5) failure of utilization of iron, (6) disturbance of haemoglobin synthesis. Under the last heading were considered thalassaemia and congenital and acquired sideroblastic anaemia. The findings in three cases of sideroblastic anaemia were discussed in detail with differential diagnosis.

Dr. Britton said that the following features suggested that these refractory sideroblastic anaemias were due to disturbance of haemoglobin synthesis: first, the presence of large numbers of iron granules in late normoblasts with poor haemoglobinization; second, the fact that radioactive iron given intravenously rapidly disappeared from the blood without comparable production of haemoglobin; third, the fact that the amount of red-cell coproporphyrin was high, whereas that of red-cell protoporphyrin was low, a reversal of the findings in normal cases; and, finally, that iron was concentrated in the mitochondria of the cells rather than in the cell cytoplasm.

In the discussion Dr. R. J. WALSH (Sydney) pointed out that, although excessive transfusion might cause transfusion sclerosis, transfusion had a value in lessening the excessive absorption of iron from the bowel in sideroblastic anaemia.

Tuesday, February 7 (afternoon)

Graft versus Host Reactions

Under the chairmanship of Dr. J. O. MERCER (Wellington), Professor N. W. NISBET (Dunedin) read a paper, with Dr. BARBARA F. HESLOP (Dunedin) and Dr. IRMGARD M. ZEISS (Dunedin) as co-authors, on the experimental problem of graft-versus-host reactions. There was increasing evidence, he said, to support the view that the histological appearances seen after renal homografts, in which the parenchyma of the grafted kidney was heavily infiltrated with plasma cells, were due to a homograft reaction mounted by the host. A graft-versus-host reaction, however, could offer an explanation to account for the deaths of immunologically helpless animals who had been injected with adult homologous lymphoid cells. Specific immunological tolerance was induced in the laboratory by the injection of adult homologous lymphoid cells into immunologically incompetent small laboratory animals and birds. The injected foreign cells were antibody-producing and set in motion the train of events which led to runt disease. In chickens a "spleen-enlarging principle" was discovered. This was provoked by the injection of adult splenic cells into embryo chicks and was thought to be a graft-versus-host phenomenon. Other evidence was produced to show that the injection of foreign lymphoid tissue into immature animals seemed to react against the host, and the course of the disease seemed to resemble the behaviour of homografts in general.

The clinicopathological manifestations of runt disease in newborn rats which were injected with adult cells had been studied by Professor Nisbet and his colleagues. Large numbers of a closed colony of Wistar rats were made tolerant by injecting the newborn among them with splenic

cells from a colony of hooded donor rats. This produced a 20% incidence of runt disease in the Wistar recipients. At about two weeks of age the rats became sick, with balding, loss of skin elasticity, respiratory tract infection, and diarrhoea. Growth was stunted, and ultimately the animals died. Some of them went through a phase in which the lymphoid organs were grossly enlarged and the skin of the ears, nose, and paws remarkably reddened. Later, all animals with signs of runting became extremely pale and sometimes jaundiced, with atrophy of the lymph nodes and spleen, which was considered to be due to an antibody–antigen reaction. Professor Nisbet concluded by saying that the study of runt disease in rats was of immense value in understanding the obstacles standing in the way of successful homografting, and had given a better understanding of the auto-immune diseases.

Ischaemic Heart Disease at Necropsy

With Dr. C. J. C. BRITTON as chairman, Dr. R. A. RODDA and Dr. G. SPIERS (Dunedin) reported that the 535 cases of ischaemic heart disease found in the 3,875 necropsies carried out in the University of Otago during 1950–9 had been grouped according to the nature of the myocardial lesion. An analysis of the age and sex distribution revealed that in subjects under 60 years of age there was a significantly higher male incidence in all groups of lesions, but that over the age of 60 the rate differed only in the total figure but not in the separate groups. Although the impression was widely held that ischaemic heart disease was from three to six times more common in men than in women, the present study indicated this to be correct only under the age of 60.

Sir CHARLES BURNS (Wellington) said during the discussion that in his series of cases he had found the same type of distribution.

Iron Absorption

Dr. R. J. WALSH and Dr. SHIRLEY CANTRILL (Sydney) then presented a paper on the site of the absorption of iron from the gastro-intestinal tract. Two types of experiment were performed on rats and guinea-pigs, using Fe-59 as a tracer. In the first series, groups of rats were subjected to laparotomy, and a test dose of Fe-59 was injected either into the stomach, the jejunum, or the caecum. After 21 days the animals were killed and blood from the heart was collected with a needle and syringe. The abdominal organs were perfused with physiological saline through the inferior vena cava and the radioactivity in the blood, liver, spleen, and kidneys measured and expressed as a percentage of the dose injected. Studies were performed to determine whether the state of the iron or the size of the dose was important. In the second series, a dose of Fe-59 was given by stomach-tube to rats and guinea-pigs. At intervals of 4, 8, and 24 hours the animals were killed and the tissues of the alimentary tract examined and the degree of radioactivity and the distribution of the Fe-59 determined. Blood was also collected from the hearts of these animals to give some idea of the rate of absorption of the test dose.

In the first type of experiment it was found that iron was absorbed to an equal extent after injection into either the jejunum or the stomach, but that only a small amount was absorbed from the colon. In the experiments in which iron was administered to rats by stomach tube, more radioactivity was detected in the blood of the animals four hours after administration than was present at that time throughout the whole gastro-intestinal tract. This indicated that absorption of iron was rapid. When sections of the tract were examined histologically very little iron was found in the stomach and colon and more than 70% of it was detected in the first part of the duodenum. It was concluded that the stomach is not the major site of iron absorption in rats and guinea-pigs.

Thursday, February 9

Non-specific and Specific Immunity

Under the chairmanship of Dr. C. J. C. BRITTON (London), Dr. E. A. NORTH (Melbourne) read a paper on non-specific and specific immunity with special reference to *Staphylococcus aureus* and its toxin. He said that it was thought that staphylococcal alpha toxin could produce a vascular spasm which might result in persistent necrosis. A physiological antagonist, therefore, was sought among the vasodilators and it was found that a fraction of the venom of the tiger snake, which was known to be rich in the enzyme phosphatidase A, antagonized the dermonecrotic effect of the toxin. Two other fractions of the tiger-snake venom and the whole venom, all of which contained little phosphatidase A, failed to protect mice against the action of the staphylococcal toxin. However, other crude venoms, including that of the honey bee, which was known to be rich in the enzyme, were shown to prevent lethal effects from the toxin in mice. Phosphatidase A was also demonstrated to be antagonistic to the action of tetanus toxin in mice, diphtheria toxin in guinea-pigs, and *Cl. welchii* (types A and D) toxin in mice. Dr. North observed that the enzyme acted on the substrate-producing lecithin, unsaturated long-chain fatty acids, and lysolecithin, which neutralized toxins either directly or indirectly. The ionizable salt of unsaturated fatty acids such as oleic acid inactivated the toxin in the tissues but not in the blood. It was suggested that the intravenous injection of lysolecithin might act by solubilizing compounds containing neuraminic acid, which was obtained from brain homogenates. Among those compounds was a mucolipid which was present in the cerebral grey matter. This was known as ganglioside and had been shown to inactivate many exotoxins. It was observed that the action of phosphatidase A was probably part of a natural defence mechanism.

A specific type of immunity (interference immunity) was also studied in mice which had received a single injection of staphylococcal vaccine. This developed rapidly, was of short duration, and was not associated with the presence of protective antibody in the serum. The immunizing component was found in cell-free supernatants as well as in suspensions of either pathogenic or non-pathogenic staphylococci.

The Staphylococcus and the Newborn Child

Dr. V. D. PLUECKHAHN (Geelong) then presented a paper on the staphylococcus and the newborn child. He gave a bacteriological and clinical survey of staphylococcal infection as seen in 11,040 infants born in a 95-bed maternity hospital between July, 1956, and December, 1960. This hospital served the entire population of a rural industrial city of 95,000 inhabitants. Various changes were made in the conduct of the hospital during the period under study, and these alterations of routine in the maternity unit brought about a reduction in the incidence of minor staphylococcal disease in newborn babes from 41% in 1956 to 4.7% in 1960 Staphylococcal skin disease itself was reduced from 30.8% to 1.3%.

In 1956 the life of the baby in the maternity unit was very busy. He was repeatedly handled by various members of the staff, and after each meal was weighed on scales from 50% of which staphylococci could be grown. In addition, he was completely undressed once a day and bathed in a bath from which, more often than not, profuse growths of staphylococci could be grown. At regular intervals his eyes were wiped with moist swabs and antibiotic or antiseptic drops instilled. Between whiles the babies slept in community nurseries where the nursing and medical staff were continually passing to and fro, and where cribs were being made, babies being changed, and dirty linen sorted. All these factors increased the ease with which the staphylococcus was transmitted.

A definite decrease in the incidence of infection was noted after the introduction of three new principles. First, education of the nurses in general technique reduced the incidence of staphylococcal lesions by about 25%. Secondly, the baby was moved into the mother's room and was always attended by the mother. This reduced the incidence of infection by

a further 12%, although the carrier rate remained the same. When "rooming-in" was stopped by chance on lay advice, the incidence rose once more. Thirdly, in a blind trial, dry washing of the baby with hexachlorophane reduced the number of infections still further and lowered the carrier rate by 50%, whereas an inert emulsion was not effective. There were 10,401 infants who were followed for six months after birth. Only 0.3% were readmitted to hospital and 0.077% died as a direct result of staphylococcal disease. The morbidity and the mortality had a direct relationship to the occurrence of minor staphylococcal disease in the maternity unit. Phage pattern 80/81 did not play a dominant role in the frequency of minor staphylococcal disease in the newborn, and the circumstances of the infection appeared to be more important than either the type or virulence of the strain of staphylococcus.

Friday, February 10

Practical Approach to Allergy

At this session of the Section of Pathology Dr. C. J. C. BRITTON (London) delivered the A. B. Pearson Memorial Oration. He said that Dr. Pearson had been a perfect example of a true clinical pathologist, and recalled that he had been instrumental in organizing the allergy clinic at Christchurch Hospital. It was at this clinic that Dr. Britton had first learnt that the treatment of allergy could be rewarding, and from the basis of what he learnt from Dr. Pearson he had evolved his present approach to allergy. The title of his address, therefore, would be "A Practical Approach to Allergy, with Special Reference to Asthma." He emphasized that what he said would represent the methods adopted by a clinical pathologist, and stressed that he would report nothing new but hoped that his words would seem to be common sense.

He pointed out that the first essentials in dealing with the allergic patient were to take a full clinical history, perform the appropriate skin tests, and explain the disease to the patient. Treatment was based upon the history and the findings. The value of skin-testing was partly to allow the patient to visualize what happened in the lung and the nose in asthma and hay fever. Tests were performed on the forearm, and, while waiting for reactions to appear, the whole background to the disease was explained to the patient. In the case of asthmatics the inherited allergic factors and the non-specific elements were both discussed.

Dr. Britton classified the non-allergic influences as (*a*) psychological, (*b*) climatic, (*c*) respiratory infection, (*d*) mechanical irritants, and (*e*) food. He said that when the allergen had revealed itself it might be possible to produce an attack by blowing a little of the extract into the lung. This would impress the patient, who should then be given sensible and practical advice. It was usually feasible to arrange for his bedroom to be rendered as non-allergenic and free from dust as possible. The patient should be advised that everything in his room should be made of solid wood or rubber and washed twice a year. When he appreciated the nature of his condition and what he had to do to help himself, the next stage was to desensitize him by a course of injections with a vaccine. If conscientiously carried out this would produce a clinical cure but not an absolute one. The use of antihistamines, antispasmodics, and corticosteroids was only of symptomatic value, though they had an important place in the general management of the patient.

In conclusion, Dr. Britton said that the manner of dealing with the patient which he had outlined was a legacy he had inherited from the teaching of Dr. Pearson, who had always considered that it was particularly important that the patient should receive a careful explanation of all the multiple factors involved, that he should have the allergens demonstrated to him, and that these procedures should be followed by the implementation of practical measures to control any allergens which had been detected.

SECTION OF OTORHINOLARYNGOLOGY

Tuesday, February 7 *

Stapes Mobilization

With Mr. P. EISDELL MOORE (Auckland) in the chair, Mr. J. ANGELL JAMES (Bristol) read a paper on stapes mobilization. He said that following Rosen's description of his operation in 1953 there was widespread use of the indirect method of mobilization by the endaural approach. This operation offered two great advantages over the fenestration operation: (1) it left the transformer mechanization of the middle ear intact, and (2) it avoided the troublesome post-operative fenestration cavity. The early promise of the operation was not fulfilled, but improved results were obtained by direct mobilization of the footplate. In the course of months many of these cases also failed to maintain their hearing gain and required a fenestration operation or a hearing-aid once more. The next advance came when Fowler described his anterior crurotomy operation, which, however, was only suitable for cases of small localized otosclerotic foci in the anterosuperior angle of the oval window.

The introduction of types of stapedectomy operation in 1958 by Shea and Portmann with hearing improvement in 90% or more of cases was followed by descriptions of many different modifications of these techniques. The speaker then described the technique of the operation in stages. He preferred to make an endaural incision 7 mm. from the margin and turn the two ends inwards to stop short at the vascular strip just lateral to the annulus. A sufficient area of the bony meatal wall must be removed to show the whole footplate clearly. The chorda tympani nerve should be preserved if possible but divided if it interfered with access to the stapes. Complaints of dysgeusia were common even after stretching the nerve without dividing it. When the whole footplate could be seen the further steps in the operation would depend on the site and degree of otosclerotic disease.

Mr. Angell James then gave an analysis of the results of 141 mobilization operations of various types. In the early group, in which the indirect methods were used, 50 out of 73 cases showed immediate improvement of 10 decibels or more, but in only 8 was this still present two years later. By direct methods, including anterior crurotomy, 61 of 68 cases showed immediate improvement and 23 maintained this after two years. Of the mobilization techniques, the only one that seems likely to survive was the anterior crurotomy: this should be reserved only for cases in which there was a small anterior focus fixing the footplate near the anterior crus. If the posterior crus and footplate could not be mobilized by this means he favoured the Portmann interposition operation. If the footplate was extensively invaded by otosclerotic bone but could be removed entirely without undue trauma to the vestibule a total stapedectomy and replacement with a Schuknecht wire and fat graft caused least reaction and gave excellent results. If the footplate was deep and thick and the niche narrow, total stapedectomy should be abandoned and a fenestration operation performed.

The reports of total cochlear losses in up to 8% of cases of stapedectomy were cause for alarm, but analysis of results suggested that these losses were due to excessive trauma in removing the footplate and subsequent subclinical infection. In order to reduce these losses trauma to the open oval window should be reduced to the minimum, and antibiotic cover should be continued for two weeks after operation. This should limit the number of total cochlear losses to 1–2% and achieve a good hearing gain of 90%.

Discussion

Mr. G. SWINBURNE (Melbourne) asked if Dr. Schuknecht used a fat graft rather than a vein graft, and whether in the anterior crurotomy operation the footplate was not just as likely to refix as in other mobilization techniques. He said

*Continued from report in the *Journal* of February 25 (p. 582).

that on reopening cases after crural fracture he found osteoporosis. Mr. N. ROYDHOUSE (Auckland) asked if Mr. Angell James would state the criteria by which he judged his cases to be successful. Mr. L. DIMOND (Wellington) asked if Mr. Angell James would state his method of enlargement of the meatus. Dr. B. CORNISH (Auckland) asked whether in the Portmann operation the endothelium of a vein graft was sufficient to prevent refixation due to otosclerotic bone regeneration.

In reply Mr. ANGELL JAMES thought that stapedectomy operation should not be attempted without a full training in the technique, in view of the risks of cochlear loss from trauma to the labyrinth. He said that Dr. Schuknecht now preferred to use a fat graft for all cases, but that other tissues were also suitable. He did not think that after an anterior crurotomy operation there was very much likelihood of refixation, provided a sufficient gap was obtained. The usual criteria adopted for improvement were that there was at least 10 decibels of improvement in the critical speech frequencies. In order to achieve enlargement of the meatus an incision at 12 o'clock was made, and the bone could then be removed with burr or curette to enlarge the bony portion also. He thought that the vein graft in the Portmann operation was sufficient to deter refixation owing to otosclerotic bone regeneration, but he thought that this could not be said with certainty, and that time alone would tell if this were the case.

Thursday, February 9

Ultrasonic Therapy of Ménière's Disease

With Mr. A. A. MACGIBBON (Palmerston North) in the chair, Mr. J. ANGELL JAMES (Bristol) read a paper on the ultrasonic therapy of Ménière's disease. He said that otologists had long sought a method of destruction of the labyrinth which would spare the cochlea and leave the hearing unaffected. Ultrasonic vibrations had been used by Arslan for this purpose since 1953, and he had treated over 600 cases. After three years' research by the departments of otolaryngology and medical physics at Bristol it had been shown that some modifications of the apparatus and of the technique of applying the ultra-sound to the patient were advisable if complications were to be avoided and satisfactory results obtained.

The speaker emphasized that the ultrasonic vibrations must be transmitted directly to the bone over the semicircular canals after the mastoid has been opened under local anaesthesia. Liquid coupling between the bone and treatment head of the instrument was used because the vibrations are poorly transmitted from metal to air. Cooling by continuous irrigation controlled by a thermostat at 37° C. was necessary, since great heat was generated in the bone and might cause facial paralysis. A special calorimeter was used before operation to calibrate the true ultrasonic power issuing from the treatment head. The bone over the lateral semicircular canal must be thinned down to a thickness of less than 0.5 mm. to allow the maximum ultrasonic power to reach the labyrinthine fluids. In the labyrinth the vibrations were transmitted freely in the fluids with reflections from the bony walls. The treatment was continued until the labyrinth was paralysed. This point was reached when the early irritative nystagmus towards the operated side was reversed as the labyrinth on the untreated side took over full control of the eye movements. Some recovery of the labyrinth was possible when the treatment was stopped, and it was therefore continued at the full tolerated power of 6–8 watts per sq. cm. for five minutes after the last sign of irritation.

Thirty-eight cases have been treated by this technique with results which were fair in the early group and much improved in the later after modifying the apparatus and technique. The average treatment time was 21 minutes and the maximum 32 minutes since the apparatus was modified.

The objectives of treatment were (1) to abolish the attacks of vertigo; (2) to preserve the hearing; and (3) to relieve tinnitus. Immediately after the treatment the hearing was depressed with some increase in the cochlear loss. By taking audiograms every day after operation it was found that recovery in hearing began in two to three days, and the post-operative level was reached in two weeks in most cases. In two patients hearing was lost completely, and in each case it was thought to be due to the presence of a slight crack in the bone over the lateral semicircular canal.

Out of 38 cases there was some hearing depression in 10, including the two cases of total loss. In 10 cases hearing improved by 10 decibels or more. In one case there was an improvement of 33 decibels in the critical speech frequencies. Attacks of vertigo were abolished in 20, relieved but not entirely abolished in 8, continued in 3, and could not be assessed in 7 cases at present until a further interval had passed. The attacks might continue for three months after treatment and yet cease entirely after that period, since final degeneration of the vestibular end-organ was often delayed. In four cases, although complete destruction of the end-organ was not obtained, all vertigo ceased. So far as tinnitus was concerned, it ceased in 10 cases, decreased in 5 cases, was unchanged in 7 cases, and was worse in 1 case.

Further modifications of the apparatus were in hand which it was hoped would eliminate much of the equipment that was at present required to measure and control the output.

If it could be shown that the hearing improvement obtained in some cases was due to increased permeability of the endolymphatic system, earlier treatment of cases of Ménière's disease by ultrasonics might be advisable in the future.

Discussion

Mr. C. B. CORNISH (Auckland) asked how long was the period of rehabilitation after ultrasonic therapy and also whether there was any caloric response after treatment. Mr. J. A. COOMBES (Auckland) asked if Mr. Angell James had had any experience of the Portmann operation on the saccus endolymphaticus. Mr. MYLES FORMBY (London) said that he also was engaged in developing the ultrasonic treatment in conjunction with Dr. Gordon. Mr. A. MILLER (Auckland) asked what was known of the biological effects on cells of ultrasonics.

Mr. ANGELL JAMES in reply said that the time required for rehabilitation was usually shorter, and the vertigo was less severe, than after surgical destruction of the labyrinth. In some cases in which some caloric response continued there was symptomatic cure, but in a few others the attacks persisted in a less severe form. He had had no personal experience of Portmann's operation, but the reports of the results in other clinics showed only a small number of permanent successes. There were a number of papers published showing the destructive effect of ultrasonics, particularly on nerve cells and myelinated fibres.

Friday, February 10

Tympanoplasty

In the morning, with Mr. T. P. HARDIE NEIL (Auckland) in the chair, Mr. J. ANGELL JAMES (Bristol) read a paper on tympanoplasty. He said that the first descriptions of this type of operation were published in 1952 by Moritz, Wullstein, and Zollner. The underlying principles included: (1) the elimination of all disease; (2) the plastic reconstruction of the tympanic membrane and all or part of the ossicular chain, or the establishment of a by-pass route for the sound waves directly to the labyrinth; (3) the buffering of one of the two mobile labyrinthine windows to ensure phase difference between them.

If the transformer mechanism of the tympanic membrane could not be restored, a loss of 27 Db was inevitable. If one window could not be baffled, a loss of 60 Db would result. No case should be considered suitable for plastic reconstruction unless there was still a reasonable cochlear reserve. He then described tympanoplastic techniques.

A fundamental change had occurred in our outlook on middle-ear disease as a result of this new method. Previously

the objective in treatment had been primarily to render an ear safe and secondarily to eliminate discharge. Now there was the possibility also of restoring the hearing. Tympanoplasty was applicable now to all cases in which there was a good cochlear reserve and the ear could be rendered sufficiently clear of infection for tissue grafts to survive. Tympanoplasty could be performed when the operation for elimination of all the disease was done, but unless all traces of cholesteatosis could be removed with certainty it was better to perform the plastic operation at a later date and after a prolonged course of conservative treatment. He stressed the importance of excluding all infective and obstructive disease of the nose or throat before proceeding to tympanoplasty.

Describing the operative techniques, Mr. James said that he preferred to use pedicle grafts, but if that was not feasible free full-thickness grafts of the meatal skin were better than those from the postauricular region. He was convinced that grafts would not survive unless they had a good base of vascular tissue for nutrition. Artificial grafts to restore the ossicular chain had been used by some surgeons and good results reported, but it was particularly important in using these materials to be sure that no infection remained. The chief problems after operation were the reinfection of the middle ear from the eustachian tube and the persistence of infection in the cavity. Either of these could endanger the flaps. He analysed the results of 136 of these operations, in which the hearing had improved in 42%, discharge had ceased in 72%, 19% were unstable, and 9% continued to discharge. He thought that there was a good prospect of improving these results by reducing the size of the cavities by muscle grafting. The operation of tympanoplasty was still in its infancy, and improvements in its technique would bring better results in the future.

Artificial Struts

Mr. P. W. E. MOORE (Auckland) asked if Mr. Angell James thought that artificial struts of polythene tube or wire were of value in transmitting the sound vibration from the tympanic membrane. Dr. C. B. CORNISH (Auckland) asked whether failure of the graft was due to deficiency of vitality or infection, and whether a vein graft would provide additional support. Dr. G. SWINBURNE (Melbourne) warned that skin grafts could induce cholesteatosis even on their deep surface, and for this reason favoured vein grafts for tympanic perforation. Dr. P. L. PARKES (Brisbane) said that he had seen Dr. Simson Hall's cases of polythene artificial ossicles, which had been successful.

Mr. ANGELL JAMES, in reply, said that care should be taken not to allow an artificial ossicle to press directly on the drum membrane. The chief cause of failure of a graft was infection, and grafted tissue had inevitably a poor resistance. In the grafting of the tympanic membrane there was need for a method of restoring the fibrous layer as well as the epithelial. and for this purpose the addition of a vein graft on the inner aspect offered some advantages.

Trans-sphenoidal Hypophysectomy

In the afternoon, with Mr. J. L. DIMOND (Wellington) in the chair, Mr. J. ANGELL JAMES (Bristol) read a paper on trans-sphenoidal hypophysectomy. He said that partial hypophysectomy had been performed by the trans-sphenoidal route for many years, but the complete removal of the gland had been practicable only since the production of cortisone on a commercial scale. Luft and Olivecrona, of Stockholm, were the first to publish a series of cases of total hypophysectomy, but they use the transcranial route, performing their first operation in 1951.

Three methods of destruction of the hypophysis were available: (1) transcranial excision; (2) trans-sphenoidal excision; (3) radiation. The trans-sphenoidal operation could be performed by four different routes—trans-septal, transethmoidal, transantral, and transpalatal. Mr. James preferred the transethmoidal route, because, first, it was sufficiently short to enable an operating-microscope to be used, and by passing the instruments through the nose an uninterrupted view of the operative field could be obtained; and, secondly, the operation was performed through an aseptic field. He described the surgical anatomy of the gland and its relations, stressing the importance of the anterior clear window. By this route the cavernous sinuses, internal carotid artery, and the 3rd, 4th, 5th, and 6th cranial nerves could be avoided in dissecting out the gland. He then gave a description of the stages of the operation.

At present the indications for this operation include the following: (1) metastatic carcinoma of the breast and prostate, and metastatic melanomata; (2) diabetic retinitis not responding to insulin; (3) cardiac oedema not responding to diuretic and other treatment; (4) malignant exophthalmia; (5) hypophysial tumours; (6) craniopharyngioma.

After this operation, patients were entirely dependent on cortisone for existence. In addition, they often required vasopressin for diabetes insipidus and thyroid extract for myxoedema. He warned that the chief complications were haemorrhage at the time of operation, cerebrospinal rhinorrhoea, and cortisone and electrolyte crises after the operation. Stress would increase the requirement for cortisone from a basic 50–120 mg. daily up to 300 mg. daily, and intravenous injections might be needed urgently. Mr. James said that the operation, though difficult, caused very little shock or discomfort afterwards. He had performed it on 52 patients in the last ten months. In this group there were: carcinoma of the breast 48, carcinoma of the prostate 1, melanoma 1, and diabetic retinitis 2. The time was too short to record results except of a very short term. Early improvement of symptoms, of which relief from pain was most striking, had occurred in 40 of the breast cases, and the cases of prostatic cancer and melanoma. Cerebrospinal rhinorrhoea had occurred in 23 cases, the longest duration being 22 days. In most cases it had ceased in 8 days. There was one case of meningitis which recovered in 2 days. The operation mortality was 4 in 20 days. One case died of inhaled vomitus and the remainder from advancing malignant disease. He described some of the cases which had responded dramatically, including three who had previously undergone adrenalectomy and oophorectomy. He concluded by referring to the large numbers of patients dying annually from these diseases, a number of whom might benefit from this operation.

Response to Operation

Mr. A. MACGIBBON (Auckland) asked how many of these patients had sinusitis, and was that a contraindication. Dr. C. B. CORNISH (Auckland) asked whether the type of cancer bore any relation to the response to the operation. Mr. MYLES FORMBY (London) said that he thought the operation should be reserved for cases in which hormone, surgical, and other treatments had all failed.

Mr. ANGELL JAMES in reply said that so far no case of sinusitis had been encountered, but that it would be a contraindication. He had no evidence that the type of cancer bore any relation to its response. In all the cases every possible surgical, radiotherapeutic, and hormone treatment had already been tried and failed.

SECTION OF RHEUMATOLOGY

Thursday, February 9

Gold Therapy in Rheumatoid Arthritis

With Dr. MICHAEL KELLY (Melbourne) in the chair, Dr. F. DUDLEY HART (London) read a paper on the use of gold salts in rheumatoid arthritis, with particular reference to the Empire Rheumatism Council's recent controlled trial. In 1938, said Dr. Hart, the Empire Rheumatism Council had attempted to set up a multicentre double-blind controlled trial of gold therapy in rheumatoid arthritis, but the outbreak of the second world war prevented its execution, the study by Fraser in 1945 being all that ever resulted from these plans. This trial, the only double-blind fully controlled trial in the modern sense of the word up to that time, was

succeeded by a 24-centre similar trial of 30 months' duration which has only recently been completed. The results up to 18 months have been published in the *Annals of Rheumatic Diseases* (1960, **19**. 95).

Two hundred out-patients aged 29 to 64, with rheumatoid arthritis of 1 to 5 years' duration, were divided into two groups, one group receiving 50 mg. of sodium aurothiamalate ("myocrisin") by intramuscular injection weekly for 20 weeks (a total of 1 g.), the other 20 weekly injections of 0.5 μg. (a total of 0.01 mg.). Cases were allocated centrally, the two groups being balanced for age, sex, and duration of disease. Patients and their medical attendants remained ignorant of the material given. As assessed by functional capacity (judged by the physician), subjective fitness (judged by the patient), joint involvement, grip strength, number of analgesic tablets taken daily, sheep-cell agglutination test, haemoglobin, and sedimentation rate, the gold-treated patients improved to a greater degree than the controls from the third month onwards, and the improvement was still apparent twelve months after the last injection was given, though reduced in degree. No such advantage was seen on radiological examination. Toxic effects, though not severe, were twice as common and were more severe in the gold-treated group. Over a period of 18 months, gold therapy undoubtedly improved the average clinical condition of the majority of the treated group. It was clear that gold salts had still a part to play in the treatment of rheumatoid arthritis, and Dr. Dudley Hart mentioned the methods used to minimize toxic effects of treatment.

Discussion

In the discussion Dr. MOORE TWEED (Wellington) asked how long after therapy haemorrhagic lesions could be attributed to gold, since purpura and other haemorrhagic complications, sometimes fatal, might occur weeks or months after the last injection. Dr. B. S. ROSE (Rotorua) asked what types or varieties of rheumatoid disease benefited most from chrysotherapy. Dr. HART replied that there was no certain knowledge on this point, though most experienced clinicians found the active case with acutely inflamed joints did better than the more advanced and crippled case: patients in the first year of their disease were known to do better with any form of therapy, even with minimum treatment.

Dr. A. R. BROWN (Auckland) quoted a case where a female patient had a fatal haemorrhage after only two small injections of gold salts. Dr. HART replied that such cases were known to occur: it was advisable before long-term therapy with gold salts to perform a complete haematological check, including marrow biopsy, to exclude any patients with pre-existing but silent blood disorders. Dr. B. S. ROSE (Rotorua) asked if long-term studies on renal function had been done after gold administration. Dr. HART replied that he had no knowledge of such studies. In answer to a question from Dr. J. D. ABERNETHY (Havelock North) he said that a speaker at the Butazolidin Symposium held some years previously at the Royal Society of Medicine in London had commented on the frequent skin reactions seen when gold salts were given at the same time as phenylbutazone. He had seen one such case himself. Dr. MICHAEL KELLY (Melbourne) wound up the discussion by congratulating the Empire Rheumatism Council through Dr. Hart on this careful evaluation of an "old" form of treatment, long overdue after almost 30 years of general use.

COMBINED SECTIONS OF NEUROLOGY AND NEUROSURGERY AND PAEDIATRICS

Friday, February 10

Infantile Hydrocephalus

Under the chairmanship of Mr. J. E. A. O'CONNELL (London), infantile hydrocephalus was discussed. In the first paper Dr. JOHN LORBER (Sheffield) emphasized that hydrocephalus in infancy was becoming a progressively more important problem, partly because it was becoming preventable by appropriate treatment and by the prevention of infantile meningitis, partly because most cases of hydrocephalus were treatable, and also because more time was available for their study, as a result of the decreased incidence of other childhood disorders. Congenital hydrocephalus occurred in about 4 per 1,000 live births. During 1959–60 230 infants were admitted with infantile hydrocephalus. Over 30 died in the first four days, and 189 were investigated fully by ventriculography. Of the 189 investigated 34 had simple congenital hydrocephalus, 142 had hydrocephalus associated with meningomyelocele, and the remainder had various other aetiological bases for their condition. Early diagnosis by routine ventriculography was easy in infants with meningomyelocele, and the incidence was found to be 83% of all those born with this malformation. Hydrocephalus was often detectable even in the absence of the classical clinical signs of the condition. Cases of hydrocephalus had been included in a controlled therapeutic trial, in which infants were allocated by random sampling to treated or control groups. Mr. R. B. Zachary was in surgical charge of these infants, and those in the treated group were operated upon by him, using the Spitz-Holter technique. The results of this controlled trial to date indicated that infants in the treated group had a lower mortality; a larger proportion of the survivors had normal intelligence, and they did not develop clinical enlargement of the head. Already 17 of 54 controls with meningomyelocele and 6 of 9 controls with simple hydrocephalus had had to be operated on because their progress was unsatisfactory. It was found that a gross degree of hydrocephalus or a cerebrospinal fluid pressure of 300 mm. or more was a strong indication for early operative treatment. Further information and a larger follow-up were necessary to determine the need and the optimum time for operation in the milder degree of hydrocephalus.

Mr. D. ROBERTSON (Auckland) described the operative procedure of ventriculo-atrial shunt (Spitz-Holter) technique and discussed it on the basis of 15 infants with uncomplicated hydrocephalus treated in this way. There were nine survivors, who were doing well. Among the operative complications, septicaemia, thrombosis of the jugular vein, and blockage of the proximal (ventricular) catheter were the commonest. He had also found that spontaneous arrest was an uncommon phenomenon and suggested early operation in all cases.

Considerable discussion followed these papers, in which the chairman, Dr. G. FOX (Auckland), Dr. MCKENZIE (Auckland), Dr. S. LUDBROOKE (Auckland), and Dr. MATTHEWS (Auckland) took part, and were answered by the opening speakers. Among questions asked were the true incidence of hydrocephalus in babies with meningomyelocele, the management of the meningomyelocele and its relation to the development of hydrocephalus, and the extremely bad prognosis of even the "arrested" hydrocephalus as indicated by Dr. S. Ludbrooke and agreed to by Dr. J. Lorber.

SECTION OF NEUROLOGY AND NEUROSURGERY

Friday, February 10

Craniopagus Twins

Under the chairmanship of Mr. D. D. MCKENZIE (Auckland), Mr. J. E. A. O'CONNELL (London) discussed what he described as "an experience with craniopagus twins." The two infants were joined at the vertex and were presumably monovular twins. Mr. O'Connell said that the incidence of conjoined twinning was believed to be 1:50,000 to 1:80,000 births, and the incidence of craniopagus about 1:2,000,000 births. In this case the diagnosis was made *ante partum* by radiology. The infants were delivered by caesarean section. As the infants survived for several months, and as they appeared to develop individually, and as existence in that condition was unthinkable, it was decided

to attempt to separate them after extensive investigation. Unfortunately the venous drainage of the brain for each child seemed to go into the lateral sinus of the other, and at pneumoencephalography the ventricular systems were also found to communicate. Separation was carried out in conjunction with Mr. P. H. Jayes, the plastic surgeon. The cerebral gyri were separate, though they interdigitated. After separation, the dural defect was repaired with human freeze-dried dura. One twin developed postoperative meningitis, which responded to chemotherapy, and this infant's subsequent progress was good. The other infant died eight months after operation. having lived a vegetative existence. This was a result of cerebral infarction, which was unavoidable on account of the interference with normal venous drainage. The survivor was nearly three years old, and had fair physical faculties, though his mental development was slow.

Dr. NEVI (India) was surprised that it had been necessary to anaesthetize both twins and that they had had different blood counts, seeing that their venous circulations communicated. He also asked about the protection of the surviving infant's head. Mr. O'CONNELL replied that the infant was wearing a plastic helmet, which was being changed as required. Mr. D. ROBERTSON (Auckland) asked if in the future a bone-grafting was being contemplated. According to Mr. O'Connell this would probably be done. Dr. J. LORBER (Sheffield) asked if any psychometric assessments were being made on the surviving child. Mr. O'CONNELL replied that there were difficulties here. A child psychologist was able to help the situation, and his figure of the boy's intelligence quotient was available. Mr. P. H. JAYES (London) described the plastic procedures used during the operation.

SECTION OF GENERAL PRACTICE

Friday, February 10

Impact of Royal Commission Report on General Practice in the U.K.

With the president of the Section, Dr. J. H. HUNT (London), in the chair, Dr. A. N. MATHIAS (London) gave his views on the effect that the recommendations of the Royal Commission on Doctors' and Dentists' Remuneration had had, and were likely to have, on general practice in the United Kingdom. The development and improvement in a health service were, Dr. Mathias said, directly related to the amount and method of remuneration of the doctors who contracted to work in it, and he outlined how the system of remuneration of general practitioners in the British Health Service had developed. The old "club" contributory system in industrial areas led to the capitation fee system under the National Insurance Act of 1911, and the capitation fee had prevailed ever since. The speaker related how after the war and immediately before the beginning of the N.H.S., the G.P. Spens Committee evolved a formula for fixing the proper payment for doctors in a nationally organized medical service. As a result of this, remuneration became related to the cost of living and a central pool of money was established from which to distribute general-practitioner pay.

The relations between the Government and the profession in the early years of the Health Service were strained and disagreement arose on the interpretation of the Spens report. There was genuine financial hardship among G.P.s, Dr. Mathias said. In 1952 the doctors' claims for an increase were submitted to the arbitration of a High Court judge—Mr. Justice Danckwerts. The result was a vindication of the profession's reading of the intentions of the Spens Committee's recommendations and a rejection of the Government's contentions. Capitation fees were increased and a new distribution scheme was evolved designed "to secure the best possible general-practitioner service for the public." Doctors with medium-sized lists got more, a financial incentive was given to form partnerships, young doctors were assisted when necessary in their early years, and a loan fund to help partners or groups of doctors to improve their premises was founded. Dr. Mathias told his audience that all these measures were beneficial.

Inflation caught up with the Danckwerts award, and by 1955 it had fallen in terms of current purchasing power by 29%. The whole miserable business of claims by the profession and refusal by the Government began over again. This time hospital medical staff as well as G.P.s were involved. The outcome was the Royal Commission set up in 1957. It reported in February, 1960. The Commission's recommended increase (about 21%) in the central pool for G.P.s was relatively satisfactory, said Dr. Mathias. The details of its distribution were left to be negotiated between the doctors and the Ministry of Health. Both sides accepted the recommendations, but the Government's acceptance was qualified by the words "as a whole as they stand" (the "package deal"), so that failure to agree on any small item of distribution during the ensuing negotiations would invalidate the whole deal. Failure to agree on the G.P. side would prevent the hospital staff recommendations going through. In fact, owing to the Ministry's insistence on introducing into the discussions projects of its own for distributing the central pool, a breakdown in negotiations was avoided only by the G.P.s' representatives being compelled to agree to a reservation of £1m. from distribution from the pool for further discussion. No agreement on how this sum should be distributed had yet been reached.

The Review Body

Dr. Mathias then referred to the standing Review Body which was to be set up to review medical remuneration in the future. This outcome of the Royal Commission transcended in importance all the recommendations about money. As a new method of negotiation it might have lasting effects on the fortunes and status of the profession. Nevertheless, it would mean an end to the profession being able to negotiate directly with its employers. In future medical remuneration would be decided by what a body of wise, distinguished laymen thought of the profession's position, its status, its recruitment needs, and its availability and value to the community *vis-à-vis* the other professions and the new professional groups constantly emerging, and who increasingly had to serve Government or large industrial empires. "In the future we are to be placed on a rung of the ladder in the hierarchy of a planned society, and may be moved up or down as the planners think the needs of the community require." This might be a good thing, said Dr. Mathias, but in his view it could be of the greatest possible danger to medical independence and recruitment in the future. He had a feeling of deep disquiet about how things would be working in 10 to 15 years' time.

Dr. Mathias concluded by describing some of the details of the new distribution of money among G.P.s as a result of the Royal Commission's recommendations. He mentioned the opposition to merit awards for general practitioners. Looking into the future, he said that the Royal Commission's views on the deadening and equalizing effect of the capitation fee system on the conduct and standards of practice were already providing a ferment of ideas. Out of a wise application of the £1m. in reserve he could see more items of service fees being paid and perhaps rewards for continuing postgraduate study. He could see a rising enthusiasm among doctors and perhaps once more an interest in some specialization in general practice. If this led to rising standards, general practitioners would gradually return to hospital work, and this would benefit everyone.

A filmstrip entitled "The School Health Service" has been produced under the supervision of the Medical Officer of Health, Salford, and it is available to schools and health authorities in the United Kingdom and abroad. The filmstrip costs £2 12s. 6d. with teaching notes, and may be obtained on approval. Inquiries should be sent to Camera Talks, 23 Denmark Place, London W.C.2.

APPROVED NAMES

The last supplement to the consolidated list of "approved names" was published in the *Journal* of December 24, 1960 (p. 1877). A new supplement, dated February, 1961, is printed below. Communications relating to "approved names" should be addressed to the Secretary, British Pharmacopoeia Commission, General Medical Council, 44 Hallam Street, London W.1.

Approved Name	Other Names	Notes
Benzilonium bromide	3-Benziloyloxy-1: 1-diethylpyrrolidinium bromide "Portyn"	Anticholinergic
Cetoxime ..	*N*-Benzylanilinoacetamidoxime "Febramine" is the hydrochloride	Antihistamine
Cyclopentolate	2-Dimethylaminoethyl α-1-hydroxy*cyclo*-pentyl-α-phenylacetate "Mydrilate"	Spasmolytic
Epioestriol ..	Oestra-1: 3: 5(10)-triene-3: 16β: 17β-triol 16-*epi*Oestriol "Actriol"	Treatment of acne vulgaris
Erythromycin estolate	Erythromycin propionyl ester lauryl sulphate "Ilosone"	Antibiotic
Ethyl dibunate	Ethyl 2: 6-di-*tert*-butylnaphthalenesulphonate	Antitussive
Ethyloestrenol	17α-Ethyloestr-4-en-17β-ol	Anabolic steroid
Fluphenazine	10-(3-(4-(2-Hydroxyethyl)-1-piperazinyl)-propyl-2-trifluoromethylphenothiazine "Moditen" is the dihydrochloride; "prolixin" is the dihydrochloride	Sedative
Isobuzole ..	5-*Iso*Butyl-2-*p*-methoxybenzenesulphonamido-1: 3: 4-thiadiazole "Stabinol"	Oral hypoglycaemic agent
Methohexitone	α-(±)-5-Allyl-1-methyl-5-(1-methylpent-2-ynyl)barbituric acid "Brevital"; "brietal"	Hypnotic and sedative
Methoserpidine	10-Methoxydeserpidine "Decaserpyl"	Treatment of hypertension
Oxyphenbutazone	4-*n*-Butyl-2-*p*-hydroxyphenyl-1-phenylpyrazolidine-3: 5-dione "Tanderil"	Analgesic
Phenampromide	*N*-(1-Methyl-2-piperidinoethyl)propionanilide	Analgesic narcotic
Prenylamine ..	*N*-(3: 3-Diphenylpropyl)-α-methylphenethylamine "Segontin"	Treatment of angina pectoris
Prolintane ..	1-(α-*n*-Propylphenethyl)pyrrolidine 1-Phenyl-2-pyrrolidinopentane	Tonic preparation
Propiomazine	10-(2-Dimethylaminopropyl)-2-propionyl phenothiazine "Dorevane"; "largon"	Sedative
Sodium dibunate	Sodium 2: 6-di-*tert*-butylnaphthalenesulphonate "Becantyl"	Antitussive
Sulphaurea ..	*p*-Aminobenzenesulphonylurea "Euvernil"	Treatment of urinary infections
Tolpentamide	*N-cyclo*Pentyl-*N'*-toluene-*p*-sulphonylurea	Oral hypoglycaemic agent

PROLONGED PREGNANCY

DISCUSSION AT QUEEN CHARLOTTE'S

A discussion for general practitioners was held on February 24 in the Postgraduate Institute of Obstetrics at Queen Charlotte's Hospital.

Professor J. H. M. PINKERTON welcomed the local practitioners and opened the meeting on "Prolonged Pregnancy." He stated that the problem was an important one, for this was one of the areas in obstetrics where babies were still being lost unnecessarily, and it was just such preventable deaths that must be avoided if perinatal mortality was to be reduced below the level at which it had persisted for the past 12 years. After many years of argument it was now generally accepted that human pregnancy might sometimes be prolonged and that this brought a real, if small, risk to the foetus concerned.

Rising Risk of Anoxia

Mr. G. F. GIBBERD suggested that a "rule of thumb" would be useful as a guide in this problem. Although there was difficulty in making a diagnosis, there was the clinical entity of a mother who had gone past term. The size of the problem was seen when an analysis of 7,695 deliveries at Queen Charlotte's Hospital showed that over 30% of patients had a pregnancy prolonged over 40 weeks, but only 8.5% went 42 weeks or more. Even if a baby was delivered at the optimum time of 280 days and no other cause of death was present, there was still a 0.5% risk of its dying of anoxia. After 42 weeks the risk became greater and by 44 weeks had risen to 4.3%. The main problem appeared to be one of anoxia.

Of the patients referred to Mr. S. G. CLAYTON with "post-maturity," about one-third had some factor which cast suspicion on the diagnosis and there was no reliable method of estimating the duration of the pregnancy. The dangers of post-maturity appeared to stem from the difficulties in labour, and comparison of labour in patients at term and in prolonged pregnancy with babies of equal weight showed that the labour in the post-mature group was more apt to be difficult. This tendency was most marked in primigravidae and suggested that perhaps the uterus was at fault. Routine induction would mean that at 41 weeks 20% of patients would be induced, at 42 weeks 10%, and at 43 weeks 3%; he personally considered each case individually. With primigravidae one must ask, "Does the risk of surgical induction exceed the risk of post-maturity?" The risk to the foetus was not marked before labour, and on the whole it was better not to interfere but to wait upon events and be ready to interfere for foetal distress. For the general practitioner it was advisable to send post-mature patients to hospital, not only because of the dangers of induction but because of the anticipated difficult labour and delivery. By this means it was hoped to improve the results.

Meconium-staining

Mr. T. L. T. LEWIS reviewed the main schools of thought; all agreed that perinatal mortality was increased when pregnancy was prolonged. There were drawbacks to routine induction because in many cases there was no need to interfere. Withdrawal of liquor might cause further placental insufficiency when anoxia existed, and labour was often prolonged in these cases. The question was, "How can we pick out those cases of post-maturity in which the oxygen supply to the foetus is so low that it is in danger of dying?" An investigation of 84 cases induced for post-maturity at Queen Charlotte's Hospital had shown that in 64 cases there was no meconium in the liquor at any time, and in this group there was no foetal mortality. In the remaining cases there was meconium in the liquor either at induction (11 cases) or later (9 cases). Taking into account only the findings at the time of surgical induction, there were 73 cases without meconium, with two stillbirths; whereas in the 11 cases with meconium present there were three stillbirths. Of the 20 cases with meconium in the liquor 16 were primigravidae and 17 were over the age of 25, and all those with stillbirths were primigravidae over the age of 25.

It was suggested, therefore, that it was logical to rupture the membranes after the 42nd week in primigravidae over 25 years old, in order to find those with placental insufficiency as shown by the presence of meconium, provided that one was prepared to do a caesarean section in those with meconium. This meant that such treatment should be undertaken in hospital by an obstetrician and not by practitioners who did not have the facilities to act on their findings.

Dr. A. E. CLAIREAUX described the pathology of anoxic stillbirths. The incidence of deaths due to anoxia rose rapidly after term and at 44 weeks accounted for half the stillbirths. Examination of these stillbirths both in the gross and microscopically showed the presence of inhaled meconium.

Surgical Induction

Mr. J. M. HOLMES had found that, of 1,000 surgical inductions performed in the three years 1956–8 at Queen Charlotte's Hospital, 29% had, as an indication, post-maturity. The infant mortality rate when labour was induced was 50/1,000, compared with an infant mortality rate of 43.8/1,000 for all deliveries. It was suggested that

(*Continued at foot of next page*)

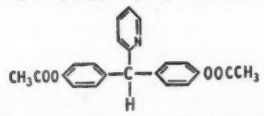
To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in common use.

Bisacodyl

"Dulcolax" (Boehringer-Pfizer).

Chemistry.—Bisacodyl is a pure, colourless, tasteless compound, insoluble in water and alkalis, with the formula (4,4¹-diacetoxy-diphenyl)(pyridyl-2) methane:



Pharmacology.—This drug acts by direct contact with the mucous membrane of the large bowel. It has little or no action in the small bowel, from which it is not absorbed. In the large bowel peristalsis occurs without accompanying spasm. The ratio of effective therapeutic to the lethal dose is 1:200.

Therapy.—Tablets of 5 mg. are available, and an evening dose of 10 mg. usually produces a soft motion the next morning. Suppositories of 10 mg. act in half an hour, and, if given on the morning after two tablets have been taken orally the previous evening, enema preparation for radiological examinations can be avoided. It is a most convenient laxative for debilitated patients, and, since it is not absorbed, can be given during lactation. Tolerance to the drug does not appear to develop.

Toxicity.—Not being absorbed, this drug is relatively free of side-effects, and it does not cause observable irritation of intestinal mucous membrane.

Contraindications.—None specific, though it is recommended that antacids should not be taken simultaneously with bisacodyl.

N.H.S. Basic Price.—50 10-mg. suppositories, 12s. 6d.; 200 5-mg. tablets, 10s. 10d.

(*Continued from preceding page*)

the problem was a mechanical one due to minor degrees of cephalo-pelvic disproportion and occipito-posterior positions. Better results would be obtained if antibiotics and an oxytocin drip were given if labour was not established within 36 hours of membrane rupture.

Dr. A. WHITE FRANKLIN said that the impact on the paediatrician was made largely at the monthly stillbirth meeting held with the pathologists. Something other than post-maturity was involved, and there was a danger that we were muddling ourselves by arguing about the reality of post-maturity. The one common factor in these stillbirths was that the baby was born at 42 weeks or more and we might be making false premises. Dr. D. LATTO did not think that post-maturity was a hazard *per se* but the danger was one of dystocia. Far more attention should be paid to the dangers of mild pre-eclampsia and a strict diet should be advised in pregnancy. On this regime in his practice he had induced far fewer patients than before.

Professor PINKERTON, in concluding, thought the main difficulty was one of diagnosis, and it would help if patients knew accurately when their last period had occurred. The date of quickening, if accurate, could be a help, as was examination early in pregnancy. Dr. Latto had mentioned mild pre-eclamptic toxaemia, and this could be a matter of life or death for the foetus and there was need to review our criteria for the early diagnosis of this condition. While the majority of pregnancies past term did not cause trouble, some did, and it would be a great help if we could anticipate those cases in which the foetus was likely to be in danger; hormone studies and vaginal cytology might help in the future. Meanwhile, we must bear in mind the risks to both mother and foetus if we decided to interfere on behalf of the foetus in uncomplicated prolonged pregnancy.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Resurgence of V.D.

SIR,—The timely paper by Dr. C. S. Nicol (February 18, p. 445), concerning the recrudescence of venereal diseases, has left no doubt as to the deteriorating situation as regards gonorrhoea, and the continuing perplexity in respect of the so-called non-specific genital infections.

Although the numbers for total syphilis of all stages continue to fall, this is the reward of the declining incidence of early infectious syphilis of the past decade and a half. As pointed out in the leading article in the same issue (p. 482), the numbers for early infectious syphilis have in fact risen from 704 cases in 1958 to 775 in 1959 (an increase of 10.1%), and indeed larger percentage increases have recently been reported in other countries.

The increases in venereal diseases have been most apparent in the larger cities and towns, and the experience of the large clinic at St. Mary's regarding infectious syphilis is not without interest. In 1955 we had only 25 cases in both sexes, which number did not greatly alter in the next two years (27 in 1958). In 1959, however, there were 72 cases, which figure rose yet again to 114 cases in 1960, and the present trend for 1961 shows no decrease. Indeed, of the national increase of 71 cases between 1958 and 1959, no less than 63.4% (45 cases) could be said to be accounted for by this clinic. It has been the experience in a number of countries that when early syphilis is well controlled a large part of the residue will be found in male homosexuals. This is certainly true of St. Mary's, where, in the years 1959–60, of 155 male cases of infectious syphilis 69 (44.5%) have been in homosexuals, which proportion is not so far decreasing.

Unlike gonorrhoea, in which disease approximately two-thirds of a recent series of our cases were in coloured immigrants (mainly West Indians), the number of such persons acquiring early syphilis heterosexually has been comparatively low—i.e., only four (6.7%) of 60 male cases in 1959. This number has, however, recently increased to 14 (14.7%) of 95 male cases in 1960, and already in the first two months of 1961 there have been a further seven cases (38.9%) of the total of 18 cases so far seen. This trend, in view of the known promiscuity of this group and the large number of sexual contacts which some individuals may have before being treated, is one, in our opinion, of considerable potential concern.—We are, etc.,

St. Mary's Hospital, London W.2.

F. J. G. JEFFERISS.
R. R. WILLCOX.

SIR,—I wish to congratulate Dr. C. S. Nicol on his article (February 18, p. 445), and you, Sir, on your leader on the same subject (p. 482). Those of us who were thoroughly trained in the diagnosis and treatment of the venereal diseases and allied infections knew quite well that the temporary reduction in such cases some ten years ago was merely a phase, and it was only "wishful thinking" that envisaged a permanent reduction in the incidence of these diseases. One would suggest, with respect, that one of the reasons for the

present unsatisfactory position is the narrow outlook of the average venereologist. Those dealing with male patients should have had wide experience in urology, and those responsible for the treatment of females should have been trained in gynaecology, while all venereologists should have had adequate neurological, dermatological, and general medical experience. Infected children require special paediatric knowledge, and all investigations require expert pathology. In other words, venereology is not the Cinderella of the specialties.

During these years of ostrich-like behaviour on the part of those in authority in the National Health Service, special hospitals and some clinics were closed to venereology and have been transferred to other uses. There has been no encouragement (indeed, rather to the contrary) for men and women to gain experience in the practice of venereal diseases and to progress to consultant status in this specialty. At the present time, therefore, infected patients (especially those with unusual manifestations) are often given somewhat casual investigation and treatment by their practitioner, or if admitted to hospital are left to the care of junior medical officers without the adequate supervision of a consultant venereologist. The "follow up" of contacts appears to be given the most slender attention.

Such conditions exist in Britain in 1961. How can we hope to be considered as leaders in medical teaching and health education by more backward countries?—I am, etc.,

London W.1. G. M. SANDES.

SIR,—Dr. C. S. Nicol's article and your leading article (February 18, pp. 445 and 482) are very interesting and of considerable importance, as these so-called "dying diseases" are again on the increase.

I have felt for many years that a more careful surveillance should be kept by the immigration authorities to prevent the easy ingress of cases of venereal diseases into Great Britain. Admittedly physical examination and serological tests are not infallible in this field, but any case so discovered should only be allowed entry on condition of full treatment when so indicated. There are, of course, other reasons for the increased incidence in the venereal diseases (specific and non-specific), but all possible measures must be adopted including the prevention of unnecessary importation of these diseases.—I am, etc.,

Charing Cross Hospital Medical School, London W.C.2. SIDNEY SHAW.

New Cases of G.P.I.

SIR,—I was most interested in the article by Dr. S. Bockner and Dr. N. Coltart (January 7, p. 18) on new cases of G.P.I. Although they quote me as having described only 14 cases, these were selected from 21 patients admitted in 18 months diagnosed as parenchymatous neurosyphilis. The St. Pancras observation ward has nearly six times the bed strength but only about treble the annual admission rate of the North Middlesex Unit (because more patients are treated and discharged rather than transferred). In view of this the totally different population at risk, and varying alternative facilities for treating syphilis, I doubt if the frequency can be assessed accurately as increasing, on comparison of these series. As diagnostic criteria are precise and the majority of cases are eventually diagnosed (unless accidentally cured by antibiotics for an intercurrent illness), it would be interesting to know if pathologists who examine the C.S.F. from patients attending various specialists have noted an increase.

Similarly the fact that Hughes as a neurosurgeon[1] could in 1959 record ten untreated cases suggests that "most cases present as psychiatric problems" should be amended to "present to a psychiatrist as psychiatric problems," because those treated successfully by neurologists, neurosurgeons, venereologists, prison medical officers, family doctors, or in the Forces are rarely seen by psychiatrists. The advice that all organic psychoses should have serological tests seems to be tackling the problem too late. The need for full physical examination and serological testing of all new psychiatric patients was fully recognized by the older clinical psychiatrists and is still practised in mental hospitals but would not appear to be the rule in out-patients, general hospitals, or psychological medicine departments. Of the 14 cases I described six had been treated at undergraduate teaching hospitals, three at hospitals running courses for postgraduates, two had had prison medical officers' reports, as well as one given E.C.T. at a neurological hospital.

Congenital syphilis is now much rarer owing to efficient routine serological testing. And though rousing support for the early detection of G.P.I. is not as easy as it is for protecting the unborn child, has not the time come for more routine serological testing? If no other argument suffices, it is certainly in our comprehensive Health Service cheaper to have many W.R.s and Kahns than the over-£100 cost of three weeks in University College Hospital, which was the shortest treatment of the 14 cases I reported. This logistical approach may appeal to those planners who exhort us to economy rather than to efficiency.—I am, etc.,

R.A.F. Hospital, Aden. ROBIN STEEL.

REFERENCE

[1] Hughes, R., *J. Neurol. Neurosurg. Psychiat.*, 1959, **22**, 81.

Pseudo-reprint

SIR,—As part of their advertisement for "salazopyrin" (sulphasalazine) the Swedish drug house Pharmacia is circulating an abstract from a report published in the *Proceedings of the Royal Society of Medicine*.[1] This abstract has been set out in the appearance of a reprint with title, authors, tables, conclusions, and references.

I am glad for the results of research work to be brought to the attention of practitioners, but I take strong exception to its being done in this way. Their advertising agents had previously approached me and asked for a number of reprints which I had felt unable to give them, as I was anxious they should not be scattered indiscriminately. There is no reason why results of research study should not be quoted within an advertising broadsheet, but to send out a separate sheet looking so like a reprint and without any authority from the people concerned is unethical.

It is the responsibility of those of us working in hospitals to help with clinical trials of new products and I have always considered it a normal part of my research activity. I expect in return that drug houses should respect the standards of our profession.—I am, etc.,

St. Mark's Hospital, London E.C.1. F. AVERY JONES.

REFERENCE

[1] Lennard-Jones, J. E., Longmore, A. J., and Avery Jones, F., *Proc. roy. Soc. Med.*, 1960, **53**, 647.

British Teachers for Overseas Medical Schools

SIR,—I would like to support Professor Ian Aird's letter (February 18, p. 499) about the desirability of British medical teachers spending some time in Commonwealth countries.

With two colleagues I have recently spent two months in India. We were particularly impressed with the great opportunities for gaining clinical experience and for carrying out very worth-while research that exist in that great country. Particularly in certain fields such as paediatrics, nutrition, and social and preventive medicine our future university medical teachers would be able to gain invaluable experience which they could not obtain in the U.K. They might also be able to help a little in solving some of India's medical problems if they could take with them some special knowledge of research techniques; for example, the conduct of therapeutic clinical trials, the organization of field surveys, and the application of statistical techniques to medical research.—I am, etc.,

JOHN PEMBERTON.

Department of Social and Preventive Medicine,
Queen's University, Belfast

Selection of Medical Students

SIR,—It is apparent from recent correspondence in the columns of the *British Medical Journal* (December 24, p. 1890, and January 14, p. 134) that there is some doubt and dissatisfaction with regard to the present methods employed in the selection of women medical students, especially concerning those who have applied to study in London. The writers, however, have only touched upon the fringe of this important and vexed problem, and it is hoped that the following account will allow them to assess the difficulties which arise in the selection of so few from so many.

Your readers may like to know recent figures concerning the total number of applications made to, and admissions into, medical schools other than those of Oxford and Cambridge as reported by the Committee of Vice-Chancellors and Principals of the Universities of the United Kingdom.[1]

	Applications 1959 (To Nearest 100)	Admissions 1959 (To Nearest 10)
England	10,800	1,170
Wales	300	60
Scotland	2,000	470
Total ..	13,100	1,700

In a further report by the Committee[2] these figures of total applications and admissions had risen in 1960 to 16,000 and 2,030 respectively.

At the present day there are virtually no economic or status barriers for those wishing to enter medicine. One is eligible for consideration to enter a medical course subject to a minimum age stipulation and certain examination qualifications.

Up to this point the career of the student has been somewhat of his own making and the necessary requirements for entrance to medicine are fully stipulated and automatic. The majority of applicants satisfy or are likely to satisfy the minimum requirements, and from this juncture the method of dealing with them is twofold: (1) paper assessment; (2) personal interview.

Here now arises the bone of contention, that being the manner in which this final selection of the medical student is made. Before changing the present system one would like an answer to two questions: "Can a *workable* alternative be devised?" and if so "will its results be *appreciably better* than the results of the present manner of dealing with the situation?" Selection from here onwards is subjective and open to the special appeal of the selectors. The variables are innumerable and it is now the difficult task of an appointed committee to carry out the selection without placing undue inconvenience on the applicants, and making an unnecessary burden of the procedure. Where a large number of applications has been received for so few places it is found necessary to grade the candidates according to their attainments, educational reports, and other qualities. When this is completed a "paper" selection may allow for certain rejections without interview. From this it may be argued that many a "desirable" student is missed, but it may be equally said that the numbers lost are so few that it would be an unnecessary inconvenience on the majority to institute a full-scale interview system.

Finally comes the selection at interview, where the wisdom of Solomon must be invoked. From this it is found that a certain proportion of applicants are outstanding in either or both their academic achievements and at interview, a small proportion are definitely not acceptable, while the majority of candidates lie within very small limits of each other.

Under the present system of selection and in dealing with such a large number of candidates, it is an impossible and impracticable task to give itemized and individual explanations for the decision of the committee, and it is sufficient to say that selection is made on both a competitive and a qualitative basis, and acceptance or rejection is subject to comparison with the general stream of applicants of that particular year.—I am, etc.,

London W.C.2. D. L. J. BILBEY,
Sub-dean, Faculty of Medical Science,
King's College.

REFERENCES

[1] Committee of Vice-Chancellors and Principals of the Universities of the United Kingdom, *Second Report of an Ad Hoc Committee on the Procedure for Admission of Students*, 1960. Vice-Chancellor's Department of the University of London.

[2] —— *Third Report of an Ad Hoc Committee on the Procedure for Admission of Students*, 1961. Vice-Chancellor's Department of the University of London.

Controlled Trial of "Gerioptil"

SIR,—For a controlled, and I have no doubt very desirable, trial of "gerioptil," Dr. M. D. Cashman and Mr. T. G. G. Lawes tell us in your columns (February 25, p. 554) that they selected "12 elderly women with moderate or advanced senile or arteriosclerotic dementia." To six they gave a month's course of 12 injections of gerioptil H3 intramuscularly. To six they gave a similar course of 12 injections of sterile water.

I will not deny that I have a certain liking for exact clinical experiment. But with these 12 old and demented women I would ask—and with considerable misgivings—whether such a meticulous control is really essential. Surely, with no control injections the trial would have been "blind" to such patients? It was made "blind," the authors report, to the observer. What more is wanted? If, nevertheless, a course of injections of sterile water were held to be essential then I would ask whether one can ethically make the trial at all. In a passion for precision and objectivity there can be too great a loss of compassion for the subjects.—I am, etc.,

London School of Hygiene and Tropical Medicine,
London W.C.1. A. BRADFORD HILL.

SIR,—As a scientist, I cannot refrain from commenting on the paper by Dr. M. D. Cashman and Mr. T. G. G. Lawes (February 25, p. 554). A controlled trial implies a carefully planned *treatment*, as well as tests for its effect and proper controls. The authors describe an elaborate series of assessments and specialized tests—so elaborate and time-consuming, in fact, that the number of patients investigated had to be limited to a statistically insignificant group of 12. These tests were intended to clarify the effects of "gerioptil" on the mental function of patients suffering from "moderate or advanced senile or arteriosclerotic dementia." This condition, I understand, is usually chronic, progressive, and not speedily improved by any treatment. Quite incredibly, the authors deemed it useful to apply the elaborate assessment tests to such patients after a *single* course of twelve injections of gerioptil H3. One would have to regard a drug as truly miraculous to expect measurable improvement in mental function in such circumstances. It would almost seem that neither Professor Aslan's writings nor a full report of her lecture in London could have been personally consulted by the authors. They do comment that her papers "fall below the standards of statistical methods, scientific control, etc."—but in none of her writings does she make any claims on the strength of a single course of 12 injections. She has also never claimed that H3 is a miracle drug, but that it is what amounts to a physiological regulator. The point repeatedly made by Professor Aslan is that senility is a chronic condition, needing chronic treatment.

The fact that the patients investigated in this "controlled trial" of one drug, tested for effect on mental function, were at the same time on sedatives and tranquillizers blurs the picture further. Individual response to such medication in terms of mental function may be very different indeed. To undertake a controlled trial without going thoroughly into the rationale of the treatment is a waste of time and effort. To publish the results is misleading. A busy practitioner glancing at the title and reading the summary would have no inkling that the study, in fact, warranted no conclusions. —I am, etc.,

M.R.C. Experimental Radiopathology Research Unit, Hammersmith Hospital, London W.12. IRENE GORE.

Hazards of Iron-dextran

SIR,—Prior to the submission of our article entitled "Possible Association of Malignant Neoplasm with Iron-dextran Injection" (August 27, 1960, p. 648), we obtained opinions on the microscopic sections of the tumour from numerous surgical pathologists. All agreed with our diagnosis of malignancy. Slides were also forwarded to Dr. L. Golberg, of Benger Laboratories, who subsequently reported Professor Willis's opinion that the lesion is benign (November 26, 1960, p. 1598).

Since that time slides have been sent to many pathologists in the U.S.A. and Canada, and returns to date favour malignancy approximately five to one. However, those who labelled it malignant presented a most disturbing variation of opinion as to its type. The following diagnoses were all reported: angiosarcoma, liposarcoma, fibrosarcoma, lymphoblastic lymphoma, rhabdomyosarcoma, and, most commonly, "sarcoma, type not determined." One opinion of especial significance is that of Dr. A. Purdy Stout, Department of Surgical Pathology, Columbia University, New York, who considers the lesion granulomatous and non-neoplastic.

The tumour has shown no sign of local recurrence and there is no clinical evidence of metastases at the present time.—We are, etc.,

C. E. G. ROBINSON.
D. N. BELL.
J. H. STURDY.
St. Paul's Hospital, Vancouver, British Columbia.

Fathers at Delivery

SIR,—If Mr. Albert Davis (February 25, p. 594) stands his expectant fathers directly opposite their wives' perinea during labour, then he must expect some paternal complications. However, if he were to sit them at that end of the patient which tends to be neglected during parturition, except for purposes of exhortation—namely, the head—then I am sure his incidence of complications would fall. Also, his concern that the husband should see those parts "usually described as private" would have less force if the husband were able to concentrate on the more public end. This concern, incidentally, plus the wonder that intercourse should again be possible after such a vision, would be more credible if obstetricians could be shown to be relatively childless.

As for Dr. J. H. Patterson's *obiter dicta* (February 25, p. 594), one can only point out that, at least in England, many conventions regarding the status of women and the nature of the marital relationship have changed since the nineteenth century, and that there is now a significant minority of parents who, whatever their motives, regard the presence of the husband during delivery as reasonable and desirable. This is not to deny that there are circumstances—for example, instrumental delivery—when it would be desirable to exclude the husband, as from a surgical operation. But the argument that the presence of the husband might embarrass the midwife or obstetrician is an argument for re-education of the latter rather than exclusion of the former from what is, after all, a common and natural, even if unglamorous, function.—I am, etc.,

London S.E.5. R. J. JARRETT.

SIR,—Doctors who advocate the attendance of husbands at their wives' confinements must be as completely devoid of imagination as such husbands are of any sensibility.—I am, etc.,

Bath. G. L. DAVIES.

SIR,—I am following with interest the correspondence on fathers at delivery. One question we should perhaps ask ourselves: to whom is the birth of a baby most important—obstetrician, midwife, or mother? Fathers are primarily excluded from seeing their offspring's arrival for the convenience of the two former, and the latter is all too frequently left to the hell of loneliness at the one time in her life she needs comforting.

A woman when she is first pregnant knows no more of the process of birth than her husband—she has to be educated to the details. If fathers were given the same courses of lectures there would be little problem about letting them attend delivery. Surely if a young wife feels the need of her husband's moral, emotional, and physical support during the birth of her baby, the medical powers-that-be have neither the duty nor the

right to refuse her. The only persons to take the decision are the husbands—most of whom have previous knowledge of the less attractive physical aspects of their wives anyway.—I am, etc.,

JEAN TAYLOR,
Regional Organizer,
Association for the Improvement of the Maternity Services.
Langley Mill, Notts.

1961 Influenza Pattern

SIR,—Influenza is an unpredictable and a very variable infectious illness. Each epidemic differs from any other, making its clinical and epidemiological studies of interest and value.

Since it is in general practice that most cases are seen, a report giving the main features of each epidemic and comparing it with others is a useful exercise. Previous epidemics from this practice have been reported[1 2] and an account of a recent one is now added for comparison. Situated in the south-eastern suburbs of London the size of the practice at the end of 1960 was as shown in Table I.

TABLE I.—*Age and Sex Composition of Practice*

	0–	10–	20–	30–	40–	50–	60–	70+	Total
Males	540	430	410	555	484	424	243	133	3,219
Females	563	414	463	572	471	368	315	296	3,462
Total	1,103	844	873	1,127	955	792	558	429	6,681

The epidemic was short and sharp. First cases were seen on January 18–19, and the peak was reached 10–14 days later. It was apparently over within four weeks. The distribution of cases is shown in Table II.

TABLE II.—*Age Distribution of Influenza*

	0–	10–	20–	30–	40–	50–	60–	70+	Total
Males	8	14	18	24	24	27	8	5	128
Females	6	4	13	16	14	20	7	4	84
Total	14	18	31	40	38	47	15	9	212
Percent. of those at risk	1·2	2·1	3·5	3·5	4·0	5·9	2·7	2·1	3·1

This epidemic of influenza A2 (this strain of virus was the one isolated in this epidemic) was a relatively mild one. Although 212 cases were seen and treated (there must have been a further 100 at least who did not seek medical advice), this represents a rate of only just over 3%. When this is compared with rates of 17% in the epidemic of 1957 and 14% in 1959, this influenza epidemic of 1961 was not severe so far as numbers are concerned. In contrast with these two previous epidemics patients between 40 and 60 were most liable to infection. In 1957 and 1959 it was children and adolescents who were most affected.

The clinical features were identical to those in previous epidemics. The dramatically sudden onset, shivering, generalized aching, malaise, and symptoms of respiratory tract irritation were again predominant. It was an extraordinary fact that not one of the 212 patients affected had suffered from influenza in 1957 or 1959. It seems, therefore, that those affected had escaped the two previous waves only to go down this time. The course in uncomplicated cases was for the acute stage to settle within four days, but it then took a further 10–14 days before the feelings of intense weakness disappeared. Treatment was non-specific and symptomatic and directed towards relieving the intense aching and coughing. There were no deaths in this series apart from the chest complications mentioned below; the only other ill-effects were in two patients who developed acute otitis media.

Chest Complications

The severity of any epidemic of influenza is most readily ascertained by noting the incidence of chest complications in the patients seen and treated. There were 29 cases of acute bronchitis and pneumonia that occurred in the 212 patients (Table III). This is a rate

TABLE III.—*Distribution of Chest Complications*

	0–	10–	20–	30–	40–	50–	60–	70+	Total
Males	3	1	3	—	1	4	3	2	17
Females	2	—	—	3	1	3	1	2	12
Total	5	1	3	3	2	7	4	4	29
Percent. of all 'flu cases	36	6	10	8	5	15	27	44	14

of 14%, which is higher than in most previous epidemics (Table V). As in previous epidemics it was the very young and the very old who were most liable to chest complications.

Comparison with Previous Epidemics

The unique characteristics of each influenza epidemic are seen in Tables IV and V. Table IV gives the age distribution of this influenza epidemic compared with

TABLE IV.—*Age Incidence of Influenza Epidemics in the Practice (Expressed in Percentages of Those at Risk)*

Year and Type	0–	10–	20–	30–	40–	50–	60–	70+	Total	Total Nos.
1950 A ..	2	4	6	8	4	10	5	4	6	223
1953 A ..	2	4	10	5	8	8	8	2	6	264
1955 B ..	6	3	3	3	3	3	3	2	3	150
1957 A ..	27	36	18	13	12	10	9	4	17	930
1959 A and B ..	25	18	14	14	11	11	8	4	14	849
1961 A ..	1	2	4	4	4	6	3	2	3	212

five previous ones since 1950. This present epidemic must therefore be classed amongst the lesser ones for incidence, but the rate of chest complications (Table V) places it amongst the more severe ones.

TABLE V.—*Incidence of Chest Complications in Influenza Epidemics in the Practice* (1950–1961) (*Expressed in Percentages of Numbers of Cases of Influenza*)

Year and Type					
1950 (A)	1953 (A)	1955 (B)	1957 (A)	1959 (A and B)	1961 (A)
20	12	10	3	10	14

Discussion

Compared with previous epidemics that have occurred in this practice over the past 11 years the influenza epidemic of 1961 was not a major one so far as size is concerned. Only 3% of the practice required treatment. The proportion of chest complications, however, was as much as 14%, which places it amongst the more severe of influenza epidemics.

In considering the seriousness of an epidemic it is much more useful to estimate this by the incidence of chest complications in a known series of cases rather than to rely on mortality figures which are supposed to have been caused by "influenza." Most of these deaths are in old people hanging on to life with chronic

cardiac and pulmonary ailments, and it is doubtful how many of these deaths in an epidemic are actually caused by the influenza virus.

A significant clinical feature in this epidemic was the fact that not one of the 212 patients with influenza had suffered a previous attack in the past five years. It is probable that the 2,000-odd patients who were affected in 1957 and 1959 still retained considerable immunity against influenza.—I am, etc.,

Beckenham, Kent. JOHN FRY.

REFERENCES

[1] Fry, J., *Brit. med. J.*, 1958, **1**, 259.
[2] —— ibid., 1959, **2**, 135.

Upright Position in Anaesthesia

SIR,—In view of the spirited reply the letter on this subject by Dr. J. G. Bourne (January 28, p. 289) evoked from Drs. Basil Finer and Jan Stahle (February 25, p. 587), I feel it may be of interest if I bring to your notice two cases that occurred in my own practice during the past year. Both patients were anaesthetized in the upright position in the dental chair with nitrous oxide with 10% oxygen delivered from a McKesson demand-flow machine. Neither was premedicated.

(1) Bantu male, aged 28 years. Quiet induction but on extraction of teeth two minutes after commencing anaesthetic administration no bleeding was observed, and further it was noticed that the patient had become extremely pale. On being laid supine his pallor disappeared, the tooth sockets commenced bleeding, and he regained consciousness.

(2) European child aged 5 years. Thirty seconds after commencing induction the child lost consciousness, became extremely pale and apnoeic. No pulse could be felt. The child was picked out of the dental chair, held head down, and artificial ventilation commenced. Within seconds of being tipped head down the pulse became palpable, respiration recommenced, the pallor disappeared, and the child regained consciousness.

I feel that both these cases may be regarded as examples of the fainting during dental anaesthesia described by Dr. Bourne.—I am, etc.,

Department of Anaesthesia, University of Capetown. GAISFORD G. HARRISON.

SIR,—Dr. B. L. Finer and Dr. Jan Stahle (February 25, p. 587) claim that, in 23,400 children anaesthetized upright for adenoidectomy in Sweden, no faint occurred. But can they be certain of this?

When I saw children anaesthetized upright for adenoidectomy in another European country, the procedure was as follows. The child was pinioned to a chair and, with a mask filled with ether-drenched cotton-wool, was rapidly made unconscious more from asphyxia than the anaesthetic. Speed dominated every move. Anaesthesia and operation together scarcely took more than one minute, and the moment the adenoids were out the child was whisked from the chair and held in a steep head-down slope over a sink. During such a performance a faint might well escape notice; and the early inversion of the patient would cut short an attack and prevent sequels. No doubt in Sweden, with its very high standards of practice, the method used is, by comparison with what I saw, infinitely refined. But if it occupies the same short space of time and ends with the child's head downwards, a faint, if it occurred, would almost certainly be missed.—I am, etc.,

J. G. BOURNE.

St. Thomas's Hospital, London S.E.1.

Clinic Doctors

SIR,—It seems inconceivable to me in these enlightened days that your correspondents in general medical practice should be so unaware of the value and functions of well-run infant welfare clinics as to write so scathingly about them. The fault must surely be due to a lack of adequate training in preventive medicine—"twaddle," according to Dr. R. W. Cockshut (February 25, p. 592). But surely even those who have not had the benefit of this education should not be incapable of realizing that the work of the clinic doctor is complementary to their own.

Take immunizations, for example. There are five diseases against which every child should be protected, provided a good health visitor is available to educate the mothers. These immunizations and their subsequent "boosters" necessitate at least eight visits before school age. Can anybody seriously deny that the average mother prefers to take her child to the more congenial and homely atmosphere of an infant welfare clinic in the company of healthy babies and their mothers than to a dreary surgery in the company of chronic bronchitics and other sick people? It is in this pleasant environment that so much useful health education can be carried out unobtrusively and minor ailments corrected. Can anyone doubt that regular attendances at these clinics have often made it possible for all manner of defects, physical, developmental, and psychological, to be recognized and referred for treatment in consultation with the family doctor, long before they would otherwise have been? The weighing of infants may be given undue importance in certain circumstances, but placed in its proper perspective it is surely accepted as a good rough guide to progress and gives a great deal of satisfaction to many mothers.

Nobody would reasonably deny that there must be good liaison between the clinic doctor and his colleague in general practice, but, given this essential requirement, each should regard the other's work with the respect and appreciation which is its due. Certainly if one were to judge by the increasing number of mothers who are attending infant welfare clinics, I could not fairly sign myself either as "redundant" or "expendable."—I am, etc.,

Holt, Norfolk. W. H. CRICHTON.

SIR,—Your correspondents Dr. R. W. Cockshut and Dr. C. R. Lynn (February 15, p. 592) have stated clearly the position regarding the school clinic doctor and the G.P. Never a week passes that I do not receive a note from a clinic doctor about the condition of a patient of which I am aware. References to hospital are often suggested, quite unnecessarily. They are always willing to refer the case "as they realize how busy I am." If they had the clinical experience that the average G.P. possesses in dealing with sick children, they would appreciate how unnecessary it is to refer many cases.

Most of the work done at the antenatal clinics is performed by doctors who have had no practical experience for years, and they would be hopelessly lost if they had to attend a confinement.

After 30 years' experience as a G.P. it is my opinion that no doctor should hold a house appointment, or be appointed a school medical officer, without some previous experience of general practice.—I am, etc.,

Newcastle upon Tyne 7. S. OSBORNE.

SIR,—Dr. R. W. Cockshut's letter (February 25, p. 592) is one of the most convincing arguments I have yet seen for the continuation of the clinic-doctor system. He has a profound contempt for preventive medicine which, fortunately for the public, is not shared by all doctors or the Minister of Health. His blinkered concentration on curative medicine can only be balanced by an active service concentrating on preventive measures.

Lest he think that the G.P. service has a monopoly of virtues I should like to draw his attention to some facts which, I feel, are more convincing than his rather colourful prejudices. "Many children when medically examined at school are still found with defects that are not being but should be treated."[1] Amongst these are defective vision and squint, defective speech, lung disease, and ear discharge. Whether one considers these important or not depends on one's attitude to medicine. 171 fatal cases of toxaemia showed that "faulty antenatal care is by far the most serious and frequent avoidable factor."[2] "Inadequate antenatal care by the midwife was apparent only once and by a local health authority only three times."[3]

All the health services require modification from time to time. Medicine is a dynamic and not a static science. Letters of the type submitted by Dr. Cockshut do little to help.—I am, etc.,

Bolton, Lancs. J. C. TALBOT.

REFERENCES

1 *The Health of the School Child. Report of the Chief Medical Officer of the Ministry of Education for the Years 1958 and 1959*, 1960, p. 13. H.M.S.O., London.
2 *Report on Confidential Enquiries into Maternal Deaths in England and Wales 1955–1957*, 1960. Reports on Public Health and Medical Subjects No. 103, p. 8. H.M.S.O., London.
3 Ibid., p. 6.

SIR,—I am convinced Dr. R. W. Cockshut (February 25, p. 592) is a male who has (obviously) never struggled with keeping a baby sucking properly at the breast, has never been baffled by how many "scoops" to how many ounces, has never listened with horror to a screaming unplacatable child, or (worse still) rushed to the cot to see if life was extinct when the crying stopped. I'm sure he has never wondered when to start baby on egg yolk, or stop boiling his water, or coped with regurgitated feeds (and the dry-cleaning bills), or even gone to bed every night for three months certain of a night call at 2 a.m. and 6 a.m.

If he had I wonder whether he would have taken his fears to a busy G.P. dealing with a 'flu epidemic (who has probably never measured out a feed in his life) or to a clinic doctor (who probably has—many times). In Dr. Cockshut's eyes I must be living very much in the past. Being a young mother of to-day (with a weekly baby clinic of my own) I welcome the health visitor with open arms whenever she calls. Need I add more ?—I am, etc.,

London N.20. BARBARA K. HOWELLS.

Infectious Mononucleosis

SIR,—Dr. I. M. Librach (January 28, p. 289) states that the titre of the Paul–Bunnell test bears no relationship to the stage or severity of infectious mononucleosis. In a study of 50 consecutive non-epidemic cases of the disease at Westminster Hospital (diagnostic criteria similar to those given previously[1]), 45 of which were sero-positive and five sero-negative, heterophile antibody titres were observed to increase during the course of the illness from the first to the third weeks, and there was a statistically significant relationship ($r=0.47$, $P<0.001$) between maximal heterophile antibody titres and the severity of the illness. The observation of increasing heterophile antibody titres during the course of the disease is well known,[2] although a relationship between heterophile antibody titre and severity cannot always be established.

Using the technique of immuno-electrophoresis,[3] with Pasteur horse anti-human serum, my colleague Mr. K. B. Cooke and I have demonstrated β_2-macroglobulin elevation developing in the course of the illness and disappearing with clinical improvement in the sera of many of these cases. This finding is of interest in view of the suggestion in your leading article (January 14, p. 111) that abnormal antibodies might be produced by the abnormal cells of the lymphocyte series.—I am, etc.,

Westminster Hospital, London S.W.1. S. B. ROSALKI.

REFERENCES

1 Rosalki, S. B., Jones, T. G., and Verney, A. F., *Brit. med. J.*, 1960, **1**, 929.
2 Hoagland, R. J., *Amer. J. Med.*, 1952, **13**, 158.
3 Scheidegger, J. J., *Int. Arch. Allergy*, 1955, **7**, 103.

Rheumatology and Physical Medicine

SIR,—Professor E. G. L. Bywaters (January 14, p. 120) writes that the Americans have always considered the "internists" to be the best suited to be rheumatologists. He reports the existence of 85 rheumatic units, endowed by research grants. His article incited a reply from Dr. Philippe Bauwens (January 28, p. 295) that the physical medicine specialist should be the director of rheumatology. He also suggests the double title of rheumatism and physical medicine for the department of physical medicine. Perhaps this is a good opportunity to re-awaken this controversy.

The Government has granted financial aid to the building of new hospitals, to be established in ten years. Now is the time to have in our minds the correct "lay-out" of the departments for rheumatic diseases. Correspondence in the *British Medical Journal* of 1959 showed that many rheumatologists had little faith in the treatment of the rheumatic diseases by physiotherapy. However, it would be advisable to have the new rheumatic departments near the physiotherapy unit, for certain types of non-articular rheumatism benefit by manipulation or deep heat treatment, and it is often beneficial to have exercise therapy for arthritic cases, with the assistance of a pool and/or slings and pulleys, and the supervision of trained physiotherapists.

Various writers in the correspondence of 1958, both from Canada and England, discussed the subject of rheumatism as a whole-time specialty, and were mostly in favour of it being a branch of general medicine. Also, as long ago as 1951,[1] the Royal College of Physicians had come to this conclusion. So let the new rheumatic units in the new hospitals be entirely devoted to the rheumatic diseases and with "rheumatism" beds allocated to the physician rheumatologist, as is in fact done at present.

When the patients have passed through the diagnostic and treatment out-patient departments, there should be the opportunity to rehabilitate in a games-room or light workshop near by. Finally, what is wrong with the single title of the Rheumatic Unit ?—I am, etc.,

London W.1. MARJORIE M. DOBSON.

REFERENCE

1 Royal College of Physicians, *Report of the Committee on Chronic Rheumatic Diseases*, 1951.

"Les Manipulations Vertébrales"

SIR,—I was amazed by Dr. James Cyriax's review (December 31, p. 1939) of Dr. Maigne's book *Les Manipulations Vertébrales*, a review in which I am unfairly treated. Dr. Cyriax wrote: "This book includes a tendentious section by Lescure on the possible visceral effects of manipulation. He does not consider the view that, when 'coronary thrombosis' or a 'grumbling appendix' is relieved by manipulation, he is dealing with misdiagnosis, and that in fact a root-pain caused by a thoracic disk-lesion has been relieved."

Apparently Dr. Cyriax has not taken the elementary precaution of reading my text, for, on the contrary, the chief purpose of the chapter for which I was responsible was to demonstrate that the claims of non-qualified people were due to clinical misinterpretations. For example, and to quote only the two subjects mentioned by Dr. Cyriax, I tried to emphasize the existence of differences between false anginal pain and true angina pectoris, the latter being well beyond improvement by mechanical means (pp. 191–192). When I mentioned some appendicular phenomena (calling them "algies pseudo-appendiculaires" and not using this odd phrase of Dr. Cyriax's, "grumbling appendix") I used the following words: "dont la plus simple explication serait qu'elles ne fussent que des algies radiculaires hautes, pseudo-viscérales" (p. 192).

Unfortunately, if Dr. Cyriax was not able to understand the text of my own chapter, it appears from other remarks of his that he also acted in the same discourteous manner concerning the other parts of the book. I realize that it would be asking too much to prevent anyone, and especially Dr. Cyriax, from professing odd personal opinions. Nevertheless, as my professional reputation is at stake in a country where I am privileged to have so many friends, I should be grateful if you would publish my reply in your correspondence columns.—I am, etc.,

Toulouse, France. R. J. LESCURE.

Vagotomy for Peptic Ulcer

SIR,—I read with interest your leading article in your issue of February 25 (p. 564). I feel that your assessment of vagotomy is rather that held generally in England in 1955. The last years have seen a tremendous change, both in England and in America. The operation of vagotomy is being used probably in every teaching centre in England and Scotland, and in many places exclusively.

The report of the American Gastroenterological Association,[1] to which you refer, was a short-term study and did not stress that the incomplete nerve-section rate was probably very high, and perhaps as high or higher than 30%. The West London Hospital studies[2] have followed 340 patients, all for at least ten years.

The electrical stimulation test is not a matter of "theory," as you suggest, but is being used routinely in some centres in this country and in America. Of about 150 cases in which complete nerve section has been proved at operation by this test since 1957, we have had only one recurrence. This patient had severe duodenal stenosis and a gastro-enterostomy. Retention of food occurred in the gastric antrum. We now know that recurrence in such cases is due to an augmentation of the hormonal phase of gastric acid secretion. Had a good pyloroplasty been done, this recurrent ulcer would not have occurred.

The Weinberg pyloroplasty, with its long incision, single-layer closure, and wide stoma, is a safe operation even in the presence of severe stenosis and an active lesion. America is fast teaching us that gastro-enterostomy will soon be obsolete as a drainage procedure.

Evidence is almost complete that selective vagotomy goes a long way, and indeed perhaps all the way, in the prevention of post-vagotomy diarrhoea. The results of a large series of cases, which you say "would be of very great interest," will soon be available for publication.

Dragstedt has always taught that duodenal ulceration is caused by an excess of gastric acid in the fasting stomach, of nervous origin, is abolished by vagotomy, and that recurrence does not occur if the vagi are completely cut and a well-made drainage procedure is added. Anyone who has compared the results of vagotomy and of gastrectomy must know that the patient with his stomach completely retained stands a much greater chance of being well than the patient with 70% of his stomach removed. Late anaemia does not occur after vagotomy, neither does severe dumping; nor do we see those disturbing cases of severe weight loss. No one knows, before gastrectomy, which patients will develop any of these disturbing sequelae. Vagotomy has almost no mortality. This is not true of gastrectomy throughout the land.—I am, etc.,

West London Hospital, London W.6. HAROLD BURGE.

REFERENCES

[1] Jordan, M. S., *Gastroenterology*, 1951, **19**, 599.
[2] Burge, H. W., *Ann. roy. Coll. Surg. Engl.*, 1960, **26**, 231.

Oral Treatment of Diabetes

SIR,—If Sir Derrick Dunlop (February 18, p. 499) will read my letter (February 4, p. 357) a little more carefully he will realize that in it, contrary to his statement, I take no exception, strong or otherwise, to the fact that retinal, renal, and vascular complications may occur in cases of diabetes due to pancreatitis and haemochromatosis, but to the use of this fact as an argument in support of the view that such complications are due to lack of insulin action. It seems to me that the only reason for selecting these two pathological conditions is the assumption that in them the lack of insulin action is due to an absolute deficiency of insulin; lack of insulin action may reasonably be assumed to be the cause of all types of diabetes. Bornstein and others[1] have shown that in the relatively mild, aketotic, and often obese diabetic the insulin content of the plasma is often within normal limits, and yet it is in this group of diabetics that complications are notoriously common. The fact that microscopic evidence of nephropathy has been reported in a number of cases of haemochromatosis does not alter the fact that clinical evidence of nephropathy is as rare in this condition as are retinal and vascular complications, nor does it justify the argument that these complications are due to a deficiency of insulin. In order to do this it would at least be necessary to demonstrate, and not just assume, a relationship between such complications and the insulin content of the plasma, and to show that a like deficiency also exists in the many similarly and usually more complicated cases of idiopathic diabetes.

With reference to Sir Derrick's final paragraph, I can only say that, if not generally accepted, it is the experience of most clinicians that retinal, renal, and vascular complications are rare in diabetes due to pancreatitis

and haemochromatosis, and there seems to be no good reason to believe that this observation will be proved fallacious to-morrow or at any future date.—I am, etc.,

Diabetic Department,
King's College Hospital,
London S.E.5.

WILFRID OAKLEY.

REFERENCE

[1] Bornstein, J., and Lawrence, R. D., *Brit. med. J.*, 1951, **2**, 1541.

Prevention of Dental Caries

SIR,—At the present time, when the amalgamation of small water authorities to form large water boards is proceeding apace, which, in my opinion, is likely to make the implementation of fluoridation of piped water-supplies much more difficult unless mandatory legislation is forthcoming (as envisaged in Eire), it is particularly unfortunate that reservations should be expressed with regard to possible resulting harmful effects on health in your leading article (January 28, p. 262). The British Medical Association is regarded generally by the public as a whole in this country as the highest "oracle" on all medical affairs, and so any reservations as to the safety of the procedure—the all-important question to the layman—is liable to be exploited by the various vociferous anti-fluoridation bodies.

Possibly the writer of this article knows of some further evidence which would invalidate the findings of the Expert Committee of the World Health Organization[1] and the earlier Medical Research Council report[2] as to its safety. Should this be the case, can we please have it at once? In any case it does not seem reasonable to wait for results from the present pilot studies to determine whether "harmful effects do occur . . . in old people after many years, probably after several decades, of drinking fluoridated water," when this sort of evidence is readily available in parts of this and other countries where the natural fluorine content of water supplies is one part per million or above.

The doubts expressed in this leading article do not seem to be easily reconcilable with the strong resolutions passed by the Public Health Committee of the British Medical Association,[3] and the even stronger one passed at the Annual Conference at Torquay[4] last year in favour of fluoridation.—I am, etc.,

Brandside,
nr. Buxton, Derbyshire.

F. D. F. STEEDE.

REFERENCES

[1] Expert Committee on Water Fluoridation, *Wld Hlth Org. techn. Rep. Ser.*, No. 146, 1958. W.H.O., Geneva.
[2] *Spec. Rep. Ser. med. Res. Coun. (London)*, No. 288, 1955. H.M.S.O., London.
[3] *Brit. med. J. Suppl.*, 1960, **2**, 172.
[4] Ibid., 1960, **1**, 395.

*** The leading article was concerned with drawing attention to clinical problems in the prevention of caries that are being investigated. It should not be taken as diminishing the force of the resolution of last year's Annual Meeting that "the fluoridation projects now in progress in the U.K. be extended where necessary and expedited."—ED., *B.M.J.*

SIR,—Lord Douglas of Barloch (March 4, p. 673) joins issue with the statement in your leading article of January 28 (p. 262) to the effect that various mechanisms succeed in "preventing a rise in fluorides to toxic levels in the tissue fluids." In doing so he cites reports to the effect that fluorine is found in milk, and that it passes the placental barrier. Since fluoride is present in all tissue fluids, it would be odd if this were not so; the issue is whether it rises to toxic levels in such fluids. On this Lord Douglas quotes only work by Rapaport alleging a relationship between the prevalence of mongolism and the level of fluoride in water.

It so happens that I recently had an opportunity to comment on Rapaport's study, and my observations will, I understand, appear in the April issue of the *Cerebral Palsy Bulletin*. For details I would refer your readers to this publication. It is sufficient here to say that in my view Rapaport's data do not support his hypothesis. The bane of epidemiology is the study which arrives at an incorrect conclusion because it is incorrectly designed. In my note to the *Cerebral Palsy Bulletin* I set out the grounds on which I believe Rapaport's study to have been incorrectly designed.

In 1958[1] I reported on the incidence of mongolism in three towns in Britain where the water contained 0.7–2.0 p.p.m. fluoride and six nearby towns where the water supply contained 0.2 p.p.m. or less. No indication whatever emerged of the relationship alleged by Rapaport.—I am, etc.,

Ministry of Health,
London W.1.

W. T. C. BERRY.

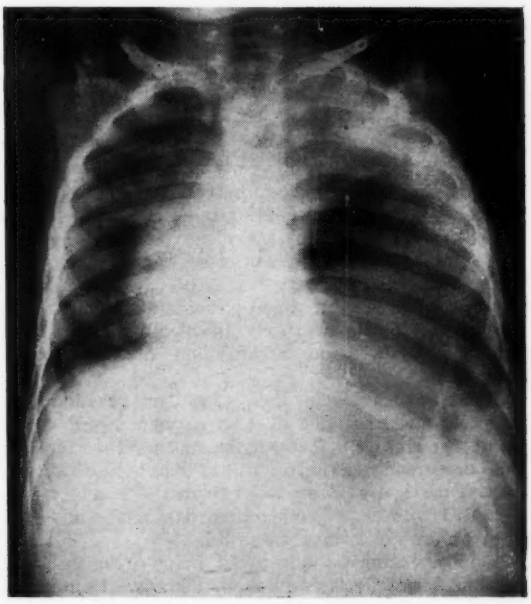
REFERENCE

[1] Berry, W. T. C., *Amer. J. ment. Defic.*, 1958, **62**, 634.

Traumatic Rupture of Diaphragm

SIR,—As traumatic rupture of the diaphragm is a rather rare occurrence, I thought it worth giving details of a case recently treated here.

A young boy, aged 6 years, was knocked down by a car about six hours prior to his admission into hospital. On examination he was obviously grossly dyspnoeic, cyanosed, and shocked, and his heart and trachea were pushed over well to the right. The left side of his chest was dull to percussion and the breath sounds were absent. He also had generalized guarding and upper abdominal tenderness more marked on the left side. There were some bruises and abrasions low down in the right iliac fossa—presumably caused by impact with the motor vehicle. There were



several minor abrasions and bruises on the left upper and lower limbs, indicating that the boy had fallen on that side. *X*-ray examination (see Fig.) showed the gastric outline to be partly in the abdomen and partly in the chest. A provisional diagnosis of a traumatic rupture of the diaphragm was made and the boy was prepared for laparotomy.

Under general anaesthesia and intubation, a T-shaped incision was made in the abdomen with the vertical limb of the T passing to the left, and a 7-in. (18-cm.) tear of the diaphragm was found running transversely in front of the oesophageal hiatus with herniation of several abdominal viscera including the liver, spleen, stomach, and colon into the left pleural cavity, which contained just over a pint (0.6 litre) of blood. There was a small tear in the spleen on its lateral surface. The rent in the diaphragm was closed with interrupted linen thread sutures, and a splenectomy was done. A stab intercostal drain was inserted into the left pleural cavity and was connected to an under-water seal. The boy was given 1½ pints (0.9 litres) of blood, and, although he had a rather stormy convalescence at first, he was up and about in two weeks and was discharged in four weeks. *X*-ray examination and screening of the chest after four weeks showed that the left lung had completely expanded and that the left cupola of the diaphragm was moving well but with slight limitation.

My thanks are due to Mr. R. Batten, the department of radiology, and the clinical photographic department of the University College Hospital, Ibadan, for their help in screening and obtaining prints of the radiograph.

—I am, etc.,

General Hospital, Ijebu-Ode, Western Nigeria. G. I. B. DA COSTA.

Treatment of Leprosy

SIR,—Dr. Spencer Reed's letter on the treatment of leprosy (December 3, p. 1672) was of great interest. He rightly emphasizes that sulphone treatment not only prevents the advance of the disease to mutilation but also prevents the social and economic complications of the disease. One cannot, however, ignore two facts: in some cases sulphone therapy precipitates reactions which lead to permanent nerve damage; and the very long period of treatment required presents serious social and administrative problems.

Dr. Reed has confined his remarks to Bali, and he would, I am sure, agree that they do not apply universally. In Tanganyika, for example—a vast country with 100,000 cases of leprosy, poor communications, and a wide variation in public opinion about leprosy—we cannot be so sanguine about reactions and cannot possibly agree with Dr. Reed that "*all* these can *quickly* be brought into a central ward" (my italics). On the other hand, there are parts of the country where the local problem is on a similar scale to that in Bali and has been tackled by a similar concentrated effort. Here, we can say with Dr. Reed, "(They have) seen with (their) own eyes the results of dapsone." But it must be emphasized that one just cannot achieve results like this *en masse* with only an effective drug. Staff, money, and a good organization are even more important.

It may be true, in Bali, that "no reaction case properly treated should develop permanently damaged nerves," but if we in Tanganyika wait until the reaction has occurred we are often too late. Further, our experience is that "properly treated" usually means "treated with a drug other than dapsone"—and even then we are not always successful.

Finally, I think we must avoid undue optimism about the long-term effects of sulphone therapy. I am seeing lepromatous cases who have been under apparently effective sulphone therapy for five, six, or seven years suddenly develop acute neuritis. "Properly treated," permanent nerve damage can be avoided, but they tend to relapse and one can never be quite sure that they will not end up with some degree of deformity.—I am, etc.,

Ministry of Health, Morogoro, Tanganyika. H. W. WHEATE.

Medicine Broadcast

SIR,—I would like to record through your correspondence columns my personal protest at the amount of dramatized medicine which now appears on television. It certainly appears to be fashionable nowadays to advertise our profession to the public.

The latest medical programme with its sensational title "Your Life in Their Hands" has recently made its debut. I shudder to think how much, and in what garbled form, the bulk of the general public will understand about exchange transfusion and open heart surgery, to mention only two subjects.

I think that medicine stands apart from other arts and sciences because of its human and personal application to every man and woman, and should not be reduced to the level of "Teach Yourself Medicine," however good the motives may be. It would be better if the general public were given guidance on such things as "Healthy Nutrition" or "Regular Fresh Air and Exercise," "Benefits of Immunization," etc.

It would be interesting to know whether or not there are others who feel similarly about this, and secondly whether or not the G.M.C. is whole-heartedly in support of this new departure in medical ethics.—I am, etc.,

Wareham, Dorset. G. D. JONES.

Relief of Pain by Cooling the Skin

SIR,—In the recent revival of interest in the relief of pain by cooling the skin (January 28, p. 250, and February 18, p. 501), I note with regret that the name of my old friend, the late Dr. J. E. O'Loghlen, is omitted. In 1942 I published an article[1] in which his technique was described. Since then it has been routine practice in my own hands and in those of my students. I should be most grateful if you will see that O'Loghlen does not forfeit the high credit he has earned by restoring a simple method to merciful use in the treatment of man—and dog.—I am, etc.,

Baily, Co. Dublin. ARNOLD K. HENRY.

REFERENCE

[1] Henry, A. K., *Lancet*, 1942, **2**, 280.

Registration of Causes of Stillbirth

SIR,—I would like to refer to the letter on the registration of causes of stillbirth (February 25, p. 586). I have attended two stillbirths since the date mentioned. In neither case was I able to hazard a guess, let alone certify, which of the twelve suggestions offered applied to my cases. In one, post-mortem examination was refused by the pathologist owing to pressure of work. I believe a midwife was eventually dragooned into writing something on the form, but these certificates must be degraded material for statistical purposes.—I am, etc.,

Southampton. C. H. BIRT.

POINTS FROM LETTERS

External Cardiac Massage

Dr. A. P. MAGONET (London W.1) writes: Before Christmas you published an annotation on external cardiac massage (November 26, p. 1582). The principle involved was pressure over the lower end of the sternum, followed by relaxation, 60 strokes to the minute. Because of the successful result the following incident may be of interest.

As medical officer of the National Sporting Club I sometimes am called to attend the members of the club who suddenly become ill. I was asked to see a man aged about 50 who had suddenly collapsed. I could feel no pulse, hear no heart sounds, and respiration was at a standstill. Recalling the annotation, I decided to try this technique. With my left hand I placed a bottle of smelling-salts to his nose and with the upper part of my right hand I pressed and relaxed my hand over the lower part of his sternum. For the first half-minute nothing happened, then slowly he began to show signs of life and then began objecting to the pressure I was exerting over his breastbone. With the help of others we carried him into a room and placed him in front of an open window. When the boxing was over and I was ready to leave, my recent patient walked over to me and said, "Thanks for your help."

An Abandoned Trial

Drs. H. S. HABIBIS and STELLA MURRAY (London W.2) write: As general practitioners studying the use of one of the monoamine oxidase inhibitors in depression by means of simultaneous straight and double-blind controlled trials, we were interested in the findings of Dr. P. M. O'Flanagan and Mr. D. Walton (December 24, p. 1888). However, we think that there is an explanation for their disappointing results with one of these drugs. Cases of depression referred to psychiatrists at hospital represent only a small minority of those seen in large numbers in general practice. Those referred to hospital consist, we believe, mainly of patients with what is usually described as "endogenous" depression and would be those least likely to respond to monoamine oxidase inhibitors; of the non-endogenous types, the exclusion of all patients showing features of anxiety (as Dr. O'Flanagan and Mr. Walton did) would automatically exclude those most likely to respond to these drugs. In general practice, we are finding that depression is very common, but it is often missed, as it is usually disguised or mixed with other symptoms. Many cases conform with those described by West and Dally[1] as "atypical depression"; others are cases of reactive depression. These illnesses may go undiagnosed for months or years, the sufferer coming to his doctor with somatic complaints such as fatigue, insomnia, mild hysteria, or psychoneurotic manifestations, and nearly all patients exhibit anxiety. In many cases prolonged and severe anxiety seems to be the cause of the depression.

REFERENCE

1 West, E. D., and Dally, P. J., *Brit. med. J.*, 1959, 1, 1491.

Infectious Mononucleosis

Dr. I. M. LIBRACH (Romford, Essex) writes: Dr. B. L. E. C. Reedy (February 25, p. 595) is mistaken in including me with Drs. D. P. Mullan, B. Dalton, and A. N. M. Davidson in their observations on palatal petechiae. My letter did not mention these and was concerned primarily with the role of the Paul–Bunnell test in diagnosis.

Randomize

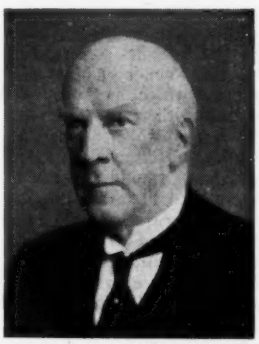
Dr. HANS CURRIE (Newmarket) writes: Dr. N. Wynn-Williams in the summary of his article (February 18, p. 469) on the control of respiratory infections in children states that he "randomized" his 96 children into two groups. . . . I suppose that when he had done this frightful thing to these children he instructed his registrar to "tetracyclinize" one group and "placebonize" the other.

Obituary

Sir THOMAS FAIRBANK, D.S.O., O.B.E., M.S. F.R.C.S.

Sir Thomas Fairbank, consulting orthopaedic surgeon to King's College Hospital and consulting surgeon to the Hospital for Sick Children, Great Ormond Street, died on February 26, at the age of 84. An influential figure in British orthopaedic surgery, he did much to improve the treatment of skeletal deformities in children.

Harold Arthur Thomas Fairbank was born on March 28, 1876, the son of a general practitioner at Windsor. From Epsom College he won an open entrance scholarship to Charing Cross Hospital, graduating M.B. in 1898, and qualified in dentistry in the following year, though he never practised as a dental surgeon. After holding the post of house-surgeon at his teaching hospital, he served as a civil surgeon in the South African War, seeing the surrender of Cronje to Lord Roberts at Paardeberg. On his return to England he took the F.R.C.S. in 1901 and proceeded M.S. in 1903. He began his long association with the Hospital for Sick Children, Great Ormond Street, at this time, for he held the post of resident superintendent there before he became surgical registrar and, later, orthopaedic surgeon to Charing Cross Hospital, the first London hospital to elect a surgeon for orthopaedic work only. He was also elected to the surgical staff at Great Ormond Street, where he had Arbuthnot Lane and Thomas Barlow as colleagues. He developed great powers of clinical observation and began to study congenital dislocation of the hip and the less commonly described skeletal diseases of children. A visit to the United States in 1914 enabled him to study the development of orthopaedic surgery in Boston, New York, and other centres.



[*Walter Stoneman*

Holding a commission in the R.A.M.C. (T.F.), Fairbank was mobilized with the 84th Field Ambulance on the outbreak of war in 1914, and served with this unit in France and Flanders—for some time at Ypres—and in Macedonia before being appointed consulting surgeon to the British Salonika Force. While holding this appointment he travelled widely on bad roads and in bad weather to help many young surgeons in the Doiran and Struma areas and was instrumental in organizing an invaluable training centre for post-operative and convalescent patients: in the second world war such units became known as rehabilitation centres.

On his return to London Fairbank was asked to take charge of the newly established orthopaedic department at King's College Hospital, and he soon became recognized as one of the leading orthopaedic surgeons in Britain. In addition to a large practice, he was working at King's, Great Ormond Street, Queen Alexandra's Military Hospital, Millbank, and at the Lord Mayor Treloar Cripples' Hospital, Alton. Eventually he became consulting surgeon at all these hospitals. He was one of four members of the staff who initiated the idea and planned a country hospital as part of the Hospital for Sick Children. At King's he organized the orthopaedic department, ensuring that it was suitable for the patients and for teaching undergraduates. He inaugurated at that hospital an out-patient fracture

clinic, the first in London and second in the country, on lines which have been followed elsewhere. Retirement from hospital work gave him no respite, and he was busy in practice and scientific work when he accepted the post of consultant adviser in orthopaedic surgery under the Emergency Medical Service during the second world war, when he was also honorary consultant in orthopaedics to the Army.

Between the wars Fairbank attended meetings of medical societies with great enthusiasm both in London and on the Continent. He was a founder member of the British Orthopaedic Association, being vice-president during part of the five years' presidency of Sir Robert Jones, and when president himself (1926–7) he chose "Some General Diseases of the Skeleton" as the title of his address. He was a founder member—and later vice-president of the Second Congress in Bologna and Rome—of the International Society of Orthopaedic Surgery. He helped to popularize the Orthopaedic and Paediatric Sections of the Royal Society of Medicine, of each of which in turn he was president. In 1951 he was admitted to the honorary fellowship of the society. At the Centenary Meeting of the British Medical Association in 1932 he was vice-president of the Section of Orthopaedics and read an important paper on disorders of the knee-joint, including osteochondritis dissecans, a disease which had been little recognized previously. He delivered the Lady Jones lecture at Liverpool University in 1929, the Robert Jones Memorial lecture at the Royal College of Surgeons in 1938, and the Simpson Smith lecture at Great Ormond Street in 1952. Of his many contributions to surgical literature those on congenital dislocation of the hip, birth palsy, and diseases of the skeleton are best known. His published work certainly influenced surgical thought: he made full use of ancillary aids such as radiographs and biochemical reports to amplify his clinical observations. In 1951 a record of his scientific study of skeletal disease was published in the form of *An Atlas of General Affections of the Skeleton*, which has proved of great value. He was awarded the D.S.O. in 1918 and appointed O.B.E. in 1919 for his services in the first world war, and appreciation of his surgical standing and of his work for the nation in the second world war was recognized by a knighthood accorded to him in 1946. The University of Liverpool made him an honorary M.Ch.Orth. in 1939. On the occasion of his 80th birthday in 1956 the *Journal of Bone and Joint Surgery* published a *Festschrift* in his honour.

Many general and orthopaedic surgeons and all associated with the teaching of his craft will remember Sir Thomas Fairbank's friendliness and particularly his care of children. Everyone who came to ask for his help with a clinical or radiographic problem received the kindliest of receptions, and his charm at work was equalled by his hospitality at home.

He married in 1909 Kathleen, youngest daughter of the late A. G. Ogilvie, and she survives him with two daughters and a son who is an orthopaedic surgeon.

D. B. writes: It is possible to feel that the conventions of obituary notices are a hindrance when one comes to write one for a man in whom there really was *nil nisi bonum*. What accounts for the universal respect and affection in which Sir Thomas Fairbank was held was his being, so to speak, all of a piece and good all through. As one who had the great good fortune to work under him at the Hospital for Sick Children, Great Ormond Street, I can remember how restful emotionally and how far from restful technically it was to be his junior. One knew he would never arrive in a bad temper, and the idea of Tommy throwing a temperamental fit in the operating-theatre brings a smile at the absurdity from those who knew him. On the other hand, he was capable of indicating with extreme clearness his opinion of a hip plaster that one had applied, or of an omission to make some needed investigation. But the absence of sarcasm or hints of mental deficiency, and the terse statements of errors and their correction, made the reproof easy to accept. One learnt, moreover, that his juniors had a privilege almost unknown among that generation of senior surgeons, that of forming, and with due deference stating, their own opinions: what this meant to certain types of mind is difficult to overestimate.

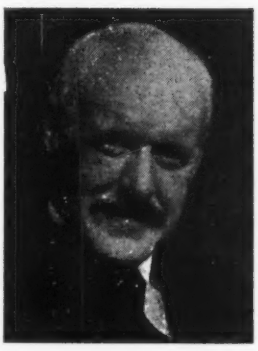
It is worth remembering as an instance of changes in fashions that his appointment at Great Ormond Street was that of a general surgeon, whose opinion on a puzzling abdomen had no superior; and who, when he could be persuaded to operate on a cleft palate, produced results better than any of his contemporaries. But of course his main interest was orthopaedics, and there he was a master. His diagnosis was a compound of logic with an unequalled knowledge of rare and obscure conditions; and his operating was like himself, simple, direct, and extremely efficient. When he cut two bones to fit together they fitted like the work of a master mason.

On the scholarly side of surgery his work differed from that of many others in that he wrote only of what he knew, without evasions or the oracular statements that conceal ignorance: his *Atlas of General Affections of the Skeleton* is a foundation of our knowledge of the infinite variety of failures in the formation of bone.

I find two pictures of this great man stay with me most vividly. One is of him addressing some small child in his usual kindly growl, without any attempt at a special voice or manner: the way in which he gained confidence and co-operation from the most timid was an unforgettable lesson in the psychology of the young. The other is of his youthful excitement when, being almost 80 and stone deaf, he was shown a weird and unidentified bone condition; the production of endless *x* rays from his unique collection, the bellowings into his useless hearing-aid, and the final endearing and characteristic admission that he could not quite place it.

T. R. ELLIOTT, C.B.E., D.S.O., M.D., F.R.C.P., F.R.S.

University College Hospital has lost another of its great men with the death on March 4 at his home in Peebles-shire of Professor T. R. Elliott, first professor of medicine and director of the medical unit at Gower Street, and afterwards professor emeritus of London University. He was 83 years of age. The whole of his career was given to University College Hospital from his appointment as a junior member of the staff in 1910 until his retirement in 1939. Elliott was above all else a physiologist. Some of his greatest work was done, or at all events begun, during his long studentship at Cambridge before he came to London. It was there he began his investigation of the chemical transmission of nerve action—work which gained him a fellowship of Clare College and later on led to his election as a Fellow of the Royal Society at the age of 36.



Thomas Renton Elliott was born at Willington, County Durham, on October 11, 1877, and was educated at Durham School. From there he went to Trinity College, Cambridge, where he took a first-class honours in both parts of the Natural Sciences Tripos. Altogether he spent eight years at Cambridge, working chiefly as a physiologist before going on to University College Hospital to qualify in medicine. He was associated with the famous school of physiology at Cambridge represented by Foster, Gaskell, Langley, and Anderson, and among men of his own generation there were Joseph Barcroft, Walter Morley Fletcher, and Henry Dale.

His own work on adrenaline attracted attention while he was still in his early twenties. In 1904, in which year he became George Henry Lewes scholar in physiology, he wrote in the *Journal of Physiology* on sympathetic action and said that adrenaline might be the chemical stimulant liberated when the impulse arrived at a smooth-muscle cell. Other work of his at this time was on the nerve supply of the viscera; a paper published in 1907 on the innervation of the bladder was actually written in the anatomical theatre of University College, to which he had come in the previous year as a student. There he won the gold medals in clinical medicine and surgery, graduated M.D. in 1908, winning the Horton Smith prize for his thesis, and became M.R.C.P. in 1910, in which year he was appointed to the staff of University College Hospital. He was elected F.R.S. in 1913 and F.R.C.P. in 1915.

A colleague of his during those years, from whose initials "T. L." one infers Sir Thomas Lewis, in a tribute to Elliott in the *University College Hospital Magazine* on the occasion of his retirement, described how Elliott and he at this time lived together in "noisy, ill-kept rooms in Mornington Place . . . where all the passing trains of what was then the Midland Railway vomited smoke and spat ashes at us. There we worked together in our common sitting-room in the evenings and dined monotonously on what passed for boiled mutton and parsley sauce." His friend recalled the Elliott of those days as always vigorous physically and mentally, eager and enthusiastic, but scrupulously exact and critical in his work, downright in his mature thought and clear speech, full of kindliness and help for others, a fascinating and stimulating companion for these reasons and for his enjoyment of life through his keen perception of things worth while. Sir Thomas Lewis also related how he and Elliott went on one occasion for a holiday to Sark and explored its under-water caves and natural aquaria. One day they took out a boat and hauled up a great skate from the depths, took it to the shore, and with pocket knives exposed the heart and watched the curious blocks and rhythms which Gaskell, Elliott's Cambridge teacher, had described.

The years from 1906 to 1914 were spent at Gower Street, first as a student, then as house-officer and Beit memorial fellow conducting research on pathological changes in the suprarenal glands, and as a junior member of staff. With the outbreak of the European war Elliott joined the Officers Training Corps and afterwards went out as an assistant to Sir John Rose Bradford, his old chief at University College Hospital, with the fighting forces in France. During the war he became consultant to the British Expeditionary Force, with the rank of colonel, and was twice mentioned in dispatches. In 1918 he gained the Distinguished Service Order, and in the following year he was made Commander of the Order of the British Empire. A noteworthy contribution of his while serving in the R.A.M.C. was on the morbid anatomy of gunshot wounds of the thorax. When the war was over he returned to the hospital, where he gave himself largely to the building up of the medical school after wartime disorganization. With the foundation of units of medical teaching he became the first unit director in the University of London, and he was the first professor of medicine to be attached to the school.

Among other appointments that he held was that of examiner in medicine to the Universities of Cambridge and Bristol. His balanced judgment was greatly valued on the Medical Research Council, of which he was a member, with one short gap, from 1920 to 1931, and again from 1939 to 1943, and on the Inter-departmental (Goodenough) Committee on Medical Schools. His writings consisted chiefly of papers in the *Journal of Physiology* and in *Brain*. He was honorary member of the Association of American Physicians and of the Rome Academy of Medicine. In 1920 he received the gold medal of the West London Medico-Chirurgical Society, and in 1947 he was made an Honorary Fellow of Trinity College, Cambridge.

During his many years as physician at University College Hospital, and later as consultant physician, generations of students profited not only from the instruction which he gave but from his kindness and genial criticism. His heart was bound up with the school. On his retirement at the age of 62 the title professor emeritus of medicine in the University of London was conferred upon him. On October 22, 1952, a week after his 75th birthday, Professor Elliott returned to the medical school to receive his portrait, which had been commissioned from the late Mr. Henry Lamb by many of his old friends and students. Professor Elliott presented the portrait to the medical school, and it now hangs in the library between the portraits of his former colleagues, Mr. Wilfred Trotter and Sir Thomas Lewis. Until a few years ago he continued to give useful service as medical adviser to the Beit Memorial and the Wellcome Trusts, but he made his home in Scotland, his wife's native country. She was Miss Martha M'Cosh, whom he married in 1918, and they had three sons and two daughters.

We are indebted to Sir FRANCIS WALSHE, F.R.S., for the following appreciation: T. R. Elliott's death closes for me a deeply cherished friendship of some fifty years. I can still recall the vivid impression he made upon me at our first meeting in Professor Starling's laboratory. The circumstances were in some ways unusual, for, after some years spent working in Langley's laboratory in Cambridge, he came down to complete his clinical course in University College Hospital, his scientific reputation already made, and he sat for an entrance scholarship. It was thus I first saw him, sitting at a bench setting up an inductorium for some practical part of the examination. It struck me as absurd to see Elliott, whose contribution to physiology I already knew of, going through these elementary performances.

But it was a little later, when he had joined the staff of University College Hospital and I was a house-physician to Dr. Risien Russell, that my friendship with him started. From that time on, and as long as we were colleagues at the hospital, there came to me from him never-ceasing kindness and encouragement that were to grow through the years. Of course, there were others similarly fortunate, but no account of Elliott can be complete that does not gratefully record the almost paternal forethought and help he showed one young man at a formative period of his life, when he was not yet certain what he wanted to do in medicine. This *caritas* was part of the secret of Elliott's greatness and influence, which are not to be measured simply by the standards of scientific or medical achievement.

When the first world war ended, Elliott became first director of the professorial unit at his hospital, and was predominantly responsible for the generous support the unit received at that time from the Rockefeller Foundation. This support was a tribute both to his prestige in science and also to his gift for negotiating. Elliott's share in all this was not appreciated at the time, as it deserved to be.

As one of his original assistants in that unit, I can speak of his wide generality of understanding and of the wisdom with which he helped us all in our work: always at hand when we needed his guidance, but never obtrusive, and never forcing one to embark upon some research project of his own choice. He preferred in his team young men who had some clear ideas of what they wanted to do, rather than those who needed to be fed with problems. His editorial advice for our papers was helpful and restrained. The use of the blue pencil as such had no particular charm for him, though he must have known Langley to have used it ruthlessly on papers submitted for the *Journal of Physiology*. What endeared him to us particularly was his loyalty and the support he gave us against some of the odds that beset unit assistants in the early days. To us he was a just man. There can be no doubt that he imparted prestige to the idea of the professorial unit in its early years, and exerted a precious influence upon medical education both inside and outside his own hospital. Perhaps, as one who is not a professor, I may suggest that the number of his old assistants who have come to occupy chairs is an indication of the standards he required and of the spirit he infused in them.

Although his last years were clouded by ill-health, he did not fail to remember his old friends and to send a letter or

some other token of his good will even up to a few weeks ago. Those of us who worked under him and with him, and enjoyed his friendship, will remember him with great affection and respect.

H. L. W. WOODROFFE, M.D., M.Ch.

Mr. H. L. W. Woodroffe, the last of the general-practitioner surgeons in Chester, died on February 23 after a short illness. He was 73 years of age.

Harry Lewis Warren Woodroffe was born on January 25, 1888, the son of Dr. A. W. Woodroffe, who practised in Sussex. He had a distinguished career as a medical student at Trinity College, Dublin, where he won a scholarship in anatomy and physiology, the Purser medal in physiology, and where he was senior moderator in natural science, winning a gold medal. Graduating M.B., B.Ch. in 1911, he won the Wheeler medal in medicine at the Royal City of Dublin Hospital. Coming to London for postgraduate hospital experience, he was house-surgeon at the Royal Cancer Hospital, clinical assistant at Great Ormond Street, and house-surgeon and house-physician at the Royal Northern Hospital. He proceeded M.D. in 1914, and shortly afterwards went to France as surgeon in charge of the Ulster Volunteer Hospital. Later he served as a captain in the R.A.M.C.

In 1918 he married Miss C. I. Cunningham, and in the following year he entered general practice in Chester. During the war he had become a skilful surgeon and had had several useful contributions on the treatment of wounds published in the *British Journal of Surgery* and other journals. He was soon elected to the surgical staff of the Chester Royal Infirmary and he was also medical officer to the Heath Lane Hospital until his death. He proceeded to the degree of M.Ch. at the University of Dublin in 1930.

In the course of a life devoted to medicine he found time to be secretary and then chairman (from 1930 to 1938) of the Chester Division of the B.M.A., president of the Chester and North Wales Medical Society, and local secretary of the Royal Medical Benevolent Fund.

Colleagues in Chester write: The death of H. L. Warren Woodroffe has removed from the medical scene in Chester one of its most outstanding figures. Although he had a busy general practice, he always kept astride new surgical developments and techniques. He retired from the staff of Chester Royal Infirmary at the age of 60, but continued to be actively engaged in general practice until the time of his death. He was going to retire at the end of March, 1961. Small in physical stature, his personality was large. He made his influence felt by his outstanding honesty and integrity, backed by a pungent wit. He leaves a widow and one son, and many sorrowing friends.

D. G. EVANS, M.D., D.P.H., D.I.H.

Dr. D. G. Evans, medical adviser to the Trades Union Congress and honorary secretary of the United Kingdom Committee of the World Health Organization, died suddenly in London on March 1.

David Gordon Evans was born on November 10, 1912. He was a medical student at St. Bartholomew's Hospital and graduated M.B., B.S. in 1938. After holding the post of senior house-surgeon at Bart's he served throughout the second world war in the medical branch of the R.A.F., rising to the rank of squadron leader and being mentioned in dispatches in 1944.

On demobilization he decided to specialize in industrial medicine and obtained the D.P.H. and the D.I.H. He proceeded to the degree of M.D. in 1947. After holding the Nuffield fellowship of social medicine at Oxford, where he worked with Professor John Ryle, he came to London as regional medical officer in the J. Arthur Rank Organization. After unsuccessfully standing as Labour candidate at Buckingham in the 1955 General Election, he was appointed deputy secretary to the Medical Practitioners' Union and lecturer at the London School of Hygiene and Tropical Medicine. In 1956 he became medical officer to Philips Electrical Industries Ltd., remaining with that firm until the middle of last year, when he was appointed the first whole-time medical adviser to the Trades Union Congress.

Dr. Evans was twice married. His first wife died of poliomyelitis, and he is survived by his second wife, Dr. Patricia Mary Elliott, and by a daughter of the first marriage and four children of the second marriage.

R. S. F. S. writes: With his general experience of practice in industry, his obvious integrity, and his common sense, Gordon Evans was well chosen as medical adviser to the T.U.C. In a few months he had also proved his ability as a teacher of occupational health at the London School of Hygiene. His quiet frankness and warm personality endeared him to all who knew him. His sudden death has deprived many people of a trusted friend and industrial medicine of a man who seemed destined to make an invaluable contribution in a most important and challenging post in the trade union movement.

C. R. D. writes: When David Gordon Evans, as a delegate from the Medical Practitioners Union, addressed the 1954 Trades Union Congress, Congress—a good judge in such matters—was quick to recognize that he was a doctor with first-hand experience of how health and safety problems present themselves on the workshop floor. This, together with great professional ability and the vigorous will to get things done which he brought to all his work, stood him in good stead when he came to take up his appointment as the first full-time medical adviser to the T.U.C. During the eight months since his appointment he had taken the measure of the job and already accomplished much. In the cruel disappointment of the hopes of so many of us, it is good to know how fully he had justified the confidence of those who believed in the need for such an appointment. "This is the right man for the right job" was the typical comment which followed a recent visit to Manchester. He practised personal relations without inverted commas, in the spirit of that "inclination towards others" of which Francis Bacon wrote, "It doth naturally spread itself towards many and maketh men become humane and charitable." The help and encouragement he had received from many quarters, including medical colleagues, meant much to him. He was working strenuously, as he would have wished, to within a few hours of his sudden death. He was a man of deep loyalties, to his friends and to the ideals of the Labour Movement. The trade union movement no less than industrial medicine has suffered a great loss.

Dr. BRUCE CARDEW writes: I worked very closely with David Evans for ten years. He assisted me as my deputy from 1953 to 1955, but I knew that this could only be a temporary arrangement,' for his heart was in industrial medicine. After he joined Philips I saw him constantly in connexion with the U.K. Committee for the World Health Organization, of which he had been honorary secretary since its formation. Last year he asked me whether he should seriously consider the newly established post at the T.U.C.—that of medical consultant. I urged him to apply, as he had all the requisite qualities for that difficult job. He took up his appointment in July and quickly made his mark. It will be difficult to replace him.

David Evans was the most warm-hearted of men and the best of company. He emanated sympathy in the true sense of the word so that every kind of person immediately felt at ease with him. Indeed, I can think of no one who was more liked by his fellow men—liked and respected also because of his integrity and moral courage. These qualities were seen at their finest in his disinterested efforts to help others less fortunate than himself. He was active in Labour politics and stood for Parliament in 1955 at great inconvenience to his medical work. He believed that there was nothing incompatible between a medical and a political career.

It is always sad when a man dies at the threshold of a promising career. David Evans had probably still to make his greatest contribution. It is sad, too, for his many friends who are left to mourn him and to sorrow for his widow and five children.

JAMES REID, M.D., M.R.C.P.

The obituary of Dr. James Reid was published in the *Journal* of March 4 (p. 678).

Professor E. J. WAYNE writes: Dr. James Reid was the first director of the clinical chemotherapeutic research unit of the Medical Research Council, which is attached to the Western Infirmary at Glasgow. He was also a lecturer in the university. The unit has been concerned mainly with the therapeutic actions of salicylates, and especially with their effectiveness in rheumatism and more recently in diabetes mellitus. After it had been shown that salicylates were peripheral metabolic stimulants, work was directed towards a fuller investigation of this fundamental phenomenon both in the laboratory and in the clinic.

As an investigator Reid was filled with a degree of enthusiasm for his subject which was infectious to his co-workers and associates. He had a wide knowledge of chemotherapy in general and strong views on the treatment of rheumatic diseases in particular. There is no doubt that further advances in these fields would have come from his department if he had survived.

Reid's downright manner was appreciated by his patients, who all held him in the highest regard. He was a staunch supporter of his staff and fought vigorously for the full independence of his department. While he enjoyed vigorous debates he was always prepared to discuss his views calmly with others interested in the same field, and there were few who could not learn from him. Reid was well known for his hospitality, and children in particular loved to be with him. He was a great country-lover, and nothing pleased him better than to take his friends to a small cottage in the wildest part of the Ardnamurchan peninsula.

Not only will the field of chemotherapy be the poorer without his new ideas and concepts, but his presence will be greatly missed by his friends and colleagues, and by his neighbours in the village of Blanefield.

Sir JOHN MCNEE writes: I think I should add a little to the obituary notices of Dr. James Reid. He was in turn my student, house-physician, Hall tutorial fellow, and lecturer, and I was thus in very close association with him during the first 15 years of his too-short career.

Reid showed an aptitude for research when a house-physician, and his first simple essay was in haematology. His real opportunity came at the outbreak of the second world war. I was naval consultant for medicine in Scotland, and the Medical Director-General, Sir Percival Nicholls, was worried by reports of scurvy and other nutritional disorders in small auxiliary ships attached to the Navy. These were mostly trawlers, suddenly called upon to undertake long and unaccustomed ocean voyages for which they were ill-equipped. An inquiry was ordered, and Reid collaborated with my wife (Geraldine McNee, M.Sc.) in investigating the matter at various ports in Scotland. There is no doubt, as he always agreed, that this work first aroused Reid's interest in medical chemistry. When their report to the Admiralty was completed, and thanked for, Reid at once joined the R.A.M.C. and was posted to Millbank for special work on malaria. It was, I believe, at Millbank that Sir Edward Mellanby, then Secretary of the Medical Research Council, first spotted Reid as a potential recruit for clinical research work for the Council.

When the war ended, Mellanby arranged that Reid should return to the Gardiner Institute, Glasgow, carrying out part-time research work for the M.R.C. but retaining his lectureship in medicine to increase and broaden his clinical experience. This was when Reid's work on rheumatic fever and the action of salicylates began, adequate laboratories and research beds being made available. Gradually, as the work progressed, it became evident that Reid and his assistants needed more scope and space than the Gardiner Institute could provide, and the question of building a special institute or unit of clinical chemotherapy arose. A good site, adjacent to the Western Infirmary, was fortunately available; and after discussions with Sir Harold Himsworth the new unit was built and completed in early 1954. It was built, and is owned, by the regional board, which recognized that they would be responsible for the patients and their treatment, for the nursing services, and for all other ancillary services to be provided by the Western Infirmary. The M.R.C. has been responsible for medical and scientific personnel, under Reid's direction, and for all laboratory and research matters. I feel that the history of this M.R.C. venture is worth recording in its relation to Reid's career.

James Reid was a downright robust character who, as he developed, always knew what he wanted to do. At work he was completely wrapped up in his research problems, but fortunately he had many out-of-doors interests as well. His friends are sad for his wife and four children (three boys and one girl), all of school age, with two of the boys now at Fettes College.

Medical Notes in Parliament

MEDICAL ADVERTISEMENTS ON TELEVISION

LORD TAYLOR ADVOCATES COMPLETE BAN

[FROM OUR PARLIAMENTARY CORRESPONDENT]

Nearly a score of peers on March 1 added their individual opinions to the mass of documentary evidence the Pilkington Commission is receiving from organized bodies of varying interests and authority on what the future development of sound and vision broadcasting should be. One of the topics in this long debate was the merit in advertisers' claims. It was introduced by Lord TAYLOR, who was highly critical of some medical advertisements and advocated a complete ban on all patent-medicine advertising on television.

The Independent Television Authority, he said, was under statutory obligation to set up an advertising advisory committee and to see that its recommendations were carried out. The Authority tried hard, but did not always succeed in this. In the booklet *Principles for Television Advertising* (third edition, I.T.A., July, 1960), a section headed "Advertising of Medicines and Treatments" set out a code, requiring that no advertisement should contain a claim to cure any ailment; should directly or by implication mislead or depart from the truth on the composition, character, or action of the medicine or treatment; and, finally, no advertisement should offer products for the treatment of haemorrhoids unless a warning notice appeared on the container or label stating "Persons who suffer from haemorrhoids are advised to consult a doctor." Among things for which remedies might not be advertised at all were blood-pressure, gall-stones, and varicose veins. But haemorrhoids were varicose veins in a special place.

Objectionable Examples

In the system of control, which he described, was a copy advisory committee run by the programme companies. If the committee did not like an advertisement they could refer it to a consulting physician or pharmacist, but it was not a very stringent test, and applied only to the small part referred to the consultant. He recited a series of examples of misleading claims or presentation which he considered to be a manifest breach of the regulations, and variously described as "scientific hokum," "a complete lie," "plainly dishonest," and one directed to sufferers from haemorrhoids which he condemned as "wicked lies" because some people who developed piles were suffering from carcinoma of the rectum and "take this beastly muck and get much worse." Although much of this television advertising did no harm, some of it was filthy, pernicious, and dishonest, and was in open defiance of I.T.A.'s own code. It arose from the simple fact that the selection of advertisements and their approval was in the hands of the people who made the money out of the advertisements—the programme companies. There was the advisory committee in the background, but it had no power and worked retrospectively. So long as the sale of television advertising time was in

the hands of the programme companies, and so long as any patent-medicine advertising was permitted, they would get this muck. If they were to ban all patent-medicine advertising the problem would be solved—as with undertakers or moneylenders, which were barred altogether. It would mean a loss of about £5m. a year to the programme companies, out of their £80m. total takings.

Lord Taylor concluded: "I have been attacking one small portion of television advertising, and giving it the hardest kicking I can, because I think it is wrong, wicked, and immoral. But, on the credit side, let us say at once that both the I.T.A. and the B.B.C. do a very good job so far as medicine is concerned. There we have no complaints. They give a very good show, and try hard; and on the programme side I have no complaints. I do not object to 'Emergency Ward 10' or 'Matters of Medicine,' and I believe that both in documentaries and fiction they do a good job of health education."

Magazine Comparison

Lord ST. OSWALD, a Lord-in-Waiting, who wound up the debate for the Government, said he had been astonished by the completeness, not to say the squeamishness, of the code in the I.T.A. booklet. Some of the advertisements he had seen were silly, but none offensive. Some of the instances Lord Taylor had given were serious, but not all of them seemed even credible. He did not believe that professional men took these things seriously when they saw them in media other than television. He had with him a magazine full of advertisements, one of them "Horlicks is part of a mother's love," and another about Lucozade. Why should television advertising deceive more people than were deceived by similar examples published in this magazine, which was published by the B.M.A.? It said "under a committee of doctors set up by the B.M.A." These advertisements were all, if they were studied, deceitful and lying, but they did no harm. He could not understand why they should do more harm on a television screen than in a magazine published by doctors.

BLOOD TESTS IN AFFILIATION CASES

[FROM OUR PARLIAMENTARY CORRESPONDENT]

Lord AMULREE has introduced into the House of Lords the Affiliation Proceedings (Blood Tests) Bill, to make blood-grouping tests available to magistrates' courts to assist in the solution of affiliation cases. It gives the courts power to order that blood tests be carried out by an approved expert. Such an order may be made on the initiative of the court or on the demand of the mother or the accused man. Clause 2 provides that samples for blood testing shall be collected by a registered medical practitioner. The testing of samples is not restricted to medical practitioners, since (an explanatory memorandum states) a number of scientists highly experienced in this work are not medically qualified. Clause 7 provides for the establishment of a Blood Tests Board, to advise the Lord Chancellor in the administration of the Act and the rules to be made by him (under Clause 6) governing the selection of approved persons to make tests; approved testing centres; the taking, identification, and transport of blood samples; certification to the court of the results of tests; and the fees and expenses payable to approved persons and medical practitioners.

The explanatory memorandum states that about 50% of men wrongly accused of paternity are exonerated by the routine tests now employed. Where there is not an exclusion the results of blood tests are the same whether the man be justly or wrongly accused; they show merely that he could be the father. Clause 3 provides that the results of the tests may be notified to the court by certificate (since the results are factual) unless either party requires the expert to give evidence of his findings. Subsection (4) provides that a certificate that does not show that the accused man is excluded from possible paternity shall not be commented on to the court, or admitted as evidence supporting the applicant, since such a certificate would in effect be merely a statement that blood grouping cannot assist the court. The definition clause states that "blood tests" shall include any test made with the object of ascertaining the inheritable characteristics of blood; and that "excluded" shall mean excluded subject to the occurrence of mutation.

SUICIDE LAW REFORM

The Suicide Bill (see *Journal*, February 25, p. 600) was given a second reading in the House of Lords on March 2.

QUESTIONS IN THE COMMONS

Diphtheria Deaths

Mrs. JOYCE BUTLER (Wood Green, Lab.) asked how many cases of diphtheria and deaths from the disease occurred in 1960 and in the first six weeks of 1961; and what was the condition as to immunization of such cases. Miss PITT stated that the provisional total of cases in England and Wales in 1960 was 53. Of these, 39 had never been immunized, eight had been immunized in infancy but had received no reinforcing dose, and two had been immunized very recently. In four cases definite information about previous immunization could not be obtained. Of the five cases which were fatal four had not been immunized, and one had been immunized very recently. Comparable figures for the number of cases in the first six weeks of 1961 were not available. During this period five children died of diphtheria, of whom four had not been immunized and one had been immunized in infancy and given a subsequent reinforcing dose 10 years ago.

Emergency Poison Centres

Dr. DONALD JOHNSON (Carlisle, Con.) asked the Minister if he would establish poison centres for the purpose of providing information in an emergency arising from unusual types of poisoning. Mr. POWELL replied that a report on this and other connected topics from his Standing Medical Advisory Committee was at present under consideration.

Admission to Obstetric List

Mr. KENNETH ROBINSON (St. Pancras, North, Lab.) asked the Minister of Health on March 6 if he had completed discussions with the medical profession about the outstanding recommendations of the Cranbrook Report and, in particular, those relating to the obstetric list and to the establishment of maternity services liaison committees. Mr. POWELL said that apart from a few minor points discussion had been completed. Uniform criteria for admission to the obstetric list were introduced in January, 1961, and it was announced that the experience of doctors already on the list would be reviewed after five years. Hospital authorities were asked in July, 1959, to take the initiative in establishing maternity services liaison committees.

Mr. ROBINSON said that many hospitals, including several of the London teaching hospitals, had not yet set up these committees; and some which had been set up were functioning far from satisfactorily. Could it be taken that, subject to the arrangement announced by the Minister which was to come into force, he fully accepted the recommendations of the Cranbrook Committee about the obstetric list? Mr. POWELL, in reply, said that the criteria which had been agreed with the profession were broadly, though not exactly, in line with the recommendations of the Cranbrook Report. They were founded upon them, and reflected them.

Medical Education

Mr. ROBINSON asked the Minister if he would advise the setting up of a Royal Commission on medical education in Great Britain. Mr. POWELL said he would not. The General Medical Council published revised recommendations on the medical curriculum in 1957 after extensive consultations with the other bodies concerned with medical education and practice. They had recently received from medical schools reports on the implementation of these

recommendations and these were being considered. Mr. ROBINSON said that even allowing for these recommendations medical teaching here was many years behind that of the United States and many European countries. This view was shared by many younger doctors and medical students, and by most psychiatrists, because the teaching of psychological medicine was particularly backward. If any further improvement was to be made some initiative must come from the Minister. It was useless leaving the matter in the hands of just those leaders of the medical profession who were responsible for the out-of-date curricula. Mr. POWELL pointed out that the responsibility of the Minister of Health for medical education was necessarily and deliberately extremely limited, and added, "I have no reason to doubt that the General Medical Council's recommendations take full account of the necessity for an expansion in psychological medicine, and this will be reflected in the results they are now considering."

Medico-Legal

INQUEST: DEATH FROM STATUS EPILEPTICUS DUE TO IDIOSYNCRASY TO COCAINE

A verdict of accidental death was returned at an inquest which was held recently on a young woman who died in hospital after cocaine had been applied to the pharynx, larynx, and trachea in preparation for a bronchogram.

The patient, aged 23, had been referred for a bronchogram because it was thought that she had bronchiectasis. After admission to hospital she was given ¼ gr. (8 mg.) cocaine subcutaneously to determine if she was allergic to this drug. The test did not show any evidence of hypersensitivity, and preparations for a bronchogram were made. The patient's pharynx was sprayed with 10% cocaine solution, and then a 1% solution of cocaine was applied to the larynx and trachea. Throughout these procedures the degree of local anaesthesia obtained was tested by asking the patient if she could swallow. At first she replied that she could, and this lack of anaesthesia was confirmed by the fact that her pharyngeal reflex was present when the pharynx was touched by the syringe nozzle of the spray. When the pharyngeal reflex had disappeared preparations were made to proceed with the injection of the dye, but before it was injected into the trachea the patient appeared to become faint and did not respond to questions. This was followed by a generalized epileptiform convulsion, for which she was given adrenaline intramuscularly. She appeared to be recovering, but then had a further series of about four epileptiform convulsions. After the final convulsion her pulse could not be felt and she was given adrenaline both intravenously and into the heart. Her pulse did not return and artificial respiration was begun and the surgical registrar and anaesthetist were summoned. The chest wall was opened and cardiac massage started, but, although the heart continued to beat with intermittent stimulation for three hours, it ceased to do so after that time.

A consultant pathologist, who carried out a post-mortem examination, said that the left lung was markedly collapsed and the right lung partially collapsed with evidence of bronchiectasis in the left base and the right middle lobe. There was also some acute oedema of the larynx. The cerebral vessels were perfectly healthy and there was no evidence of a localized epileptic focus. The meninges were rather congested. The pericardium had been opened for the purpose of cardiac massage and there were fairly numerous petechial haemorrhages on the surface of the heart, which was a little dilated throughout, but there was no evidence of valvular disease, atheroma, or congenital abnormality. The liver was very congested, but otherwise the abdominal viscera and the genito-urinary system were normal. In the pathologist's opinion the cause of death was status epilepticus due to idiosyncrasy to cocaine.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on February 18 the following degrees were conferred:

D.M.—E. H. Jellinek. Hélène V. Woolf (née Goodman).
M.Ch.—J. H. B. Yule.

Dr. P. B. C. Matthews has been appointed a University Demonstrator in Physiology from February 1, 1961, to September 30, 1965.

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examination indicated:

M.Chir.—I. J. Cour-Palais, R. V. Fiddian, L. R. H. Gracey, R. K. Greenwood W. M. Keynes, P. H. Lord, J. A. MacDougall, B. A. Maurice, A. G. Norman, H. Sunderland, K. Ll. Williams.

UNIVERSITY OF ABERDEEN

Mr. A. G. D. Whyte, who holds a terminable lectureship in the Department, has been appointed Lecturer in Anatomy from April 1, 1961, and Dr. Tarunendu Ghose, at present junior research officer, Indian Cancer Research Centre, Bombay, has been appointed to the Georgina McRobert Research Fellowship from a date to be arranged.

UNIVERSITY OF LONDON

In January the degree of M.D. was awarded to I. G. Pryce and Mary E. Carter.

UNIVERSITY OF BIRMINGHAM

In Congregation on December 16, 1960, the following degrees were conferred:

M.D.—C. T. G. Flear (with honours), J. M. Malins.
M.B., Ch.B.—P. Anderson, June A. Daniell, E. C. Emelife, W. D. Griffiths, G. M. Jones, H. H. Jones, Jean Loveridge, Ann J. Mucklow, N. R. Whiting, J. Wood.

The title of University Research Fellow has been conferred on Dr. S. J. Crews, Senior Clinical Tutor, partly in the Department of Experimental Pathology, for the period of his stay at the University.

UNIVERSITY OF BRISTOL

The following members of the staff have resigned from the appointments indicated: Dr. M. J. T. Adams, Tutor in Radiotherapy; Mr. G. A. Dalton, Tutor in Otolaryngology; and Dr. P. A. Evans, Demonstrator in Pathology.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on February 9, with Sir Stanford Cade, Vice-president, in the chair, Sir Clement Price Thomas was appointed the Thomas Vicary Lecturer for 1961.

The death of Sir Geoffrey Jefferson, F.R.C.S., F.R.S., was recorded with deepest regret.

Diplomas of Fellowship were granted to R. C. F. Cilento and G. R. James.

Mr. W. J. Dempster and Mr. O. D. Morris were elected to the Fellowship *ad eundem*.

The Hallett Prize was awarded to Captain W. C. Moffat, R.A.M.C., of the University of Glasgow, and the Handcock Prize to M. H. Devereux, of Guy's Hospital Medical School.

Diplomas of Fellowship in the Faculty of Anaesthetists were granted to the following candidates:

P. M. E. Youngman, F. C. Shelley, P. H. Dennison, R. C. Nainby-Luxmore, P. Brine, Betty V. Scott, Ruth R. Irvine, Mercedes D. Carvel, C. J. T. Archer, W. J. Hegarty, J. Barker, W. J. Love, Margaret E. Burns, C. A. B. McLaren, A. I. Weinreich, Joan H. Breed, Mavis Buck, J. A. H. Davies, H. K. Dutta, P. J. McQuade, W. D. A. Smith, S. Mehta, C. W. Thomson, R. D. Unkles, M. B. Yorston, R. S. J. Clarke, C. F. Conway, R. E. Davis, Patricia A. Edwards, Q. H. Latifi, J. A. Monro, Sandra Murdoch, E. F. Battersby, Sheena W. Campbell, H. J. L. Craig, J. G. Francis, E. G. Leonard, R. Porteous, Miriam Stafford, D. A. C. Breslin, M. D. Churcher, J. I. Clayton, A. J. Clement, M. D. Hargreaves, M. E. Hayes, R. F. Knight, W. R. MacRae.

The following diplomas were granted, jointly with the Royal College of Physicians of London:

Diploma in Laryngology and Otology.—K. W. Murphy.
Diploma in Industrial Health.—A. H. Akhand, B. Black, T. D. Browne, T. W. Carrick, G. W. Danker, A. Das Gupta, M. T. Fernandes, G. Groves, J. S. Horner, G. K. M. Khomo, N. Leitch, A. D. Macdonald, J. W. G. McDougall, W. G. D. Murray, D. G. Noble, S. E. Onejeme, M. J. Saldanha, W. D. Smith, M. B. Todd.
Diploma in Psychological Medicine.—H. C. Ferguson.
Diploma in Public Health.—M. B. Todd.
Diploma in Tropical Medicine and Hygiene.—M. A. Mirza.

After the meeting an Arris and Gale Lecture was delivered by Mr. P. H. Golding-Wood on autonomic surgery of the ear, nose, and throat.

Vital Statistics

Influenza

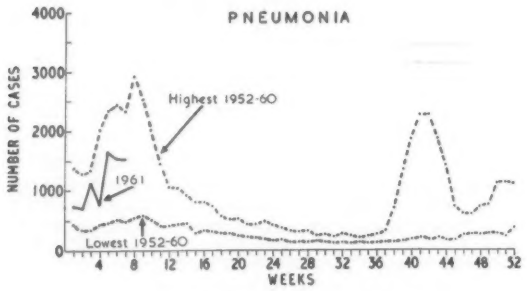
During the week ended February 25 deaths in England and Wales from influenza (568), pneumonia (1,232), and bronchitis (981) all continued to decrease, and new claims to sickness benefit also fell substantially. Influenza appeared to be on the decline in all parts of England and Wales.

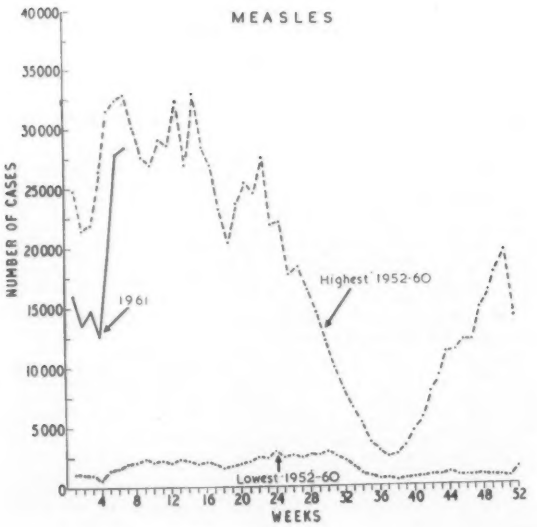
Population of New Zealand

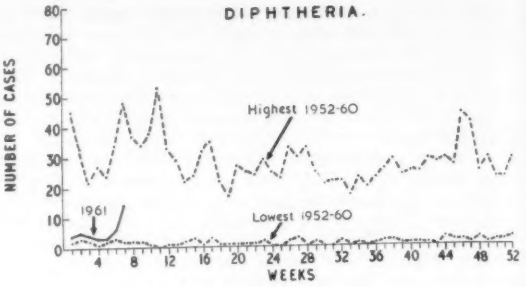
At the end of 1960 New Zealand's population was 2,403,488—1,207,976 men and 1,195,512 women. Included in these totals were 82,723 Maori men and 79,952 Maori women. During the quarter ended December 31, 1960, the population increased by 19,096: apart from the excess of births over deaths, arrivals in the country exceeded departures by 8,202.—*New Zealand News Bulletin*, March 3, 1961.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1952–60 are shown thus ------, the figures for 1961 thus ———. Except for the curves showing notifications in 1961, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.







Infectious Diseases

Areas where numbers of notifications were high in the latest two weeks for which figures are available.

Measles	Week Ending Feb. 18	Feb. 25
Durham	1,413	**1,369**
Sunderland C.B.	411	**395**
Essex	1,815	**2,336**
Harlow U.D.	66	**381**
Romford M.B.	166	**235**
Hampshire	1,075	**1,339**
Southampton C.B.	407	**328**
Kent	1,311	**1,630**
Lancashire	2,363	**2,386**
Bolton C.B.	215	**199**
Manchester C.B.	306	**323**
London	3,204	**3,339**
Battersea	209	**195**
Camberwell	257	**229**
Holborn	6	**230**
Lambeth	214	**211**
Lewisham	265	**348**
Wandsworth	460	**343**
Woolwich	177	**220**
Middlesex	1,732	**2,032**
Willesden M.B.	278	**271**
Norfolk	658	**621**
Norwich C.B.	207	**223**
Nottinghamshire	787	**654**
Nottingham C.B.	283	**219**
Staffordshire	953	**1,082**
Surrey	932	**1,145**
Warwickshire	2,011	**2,497**
Birmingham C.B.	965	**1,235**
Coventry C.B.	421	**556**
Wiltshire	183	**288**
Swindon M.B.	118	**214**
Yorkshire East Riding	644	**809**
Kingston upon Hull C.B.	486	**576**
Yorkshire West Riding	2,310	**2,504**
Leeds C.B.	254	**220**
Sheffield C.B.	287	**405**
Dysentery		
Glamorganshire	1,014	**1,117**
Cardiff C.B.	197	**325**
Gloucestershire	10	**21**
Thornbury R.D.	0	**17**
Yorkshire West Riding	239	**144**
Leeds C.B.	60	**35**
York C.B.	39	**32**
Diphtheria		
London	6	**4**
Islington	3	**2**
Glasgow	3	**2**

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **February 18** (No. 7) and corresponding week 1960.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the whole of England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1961					1960				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	16	6	3	0		5	1	1	0	4
Dysentery ..	771	66	93	16	1	1,646	200	290	17	3
Encephalitis, acute	4	0		1		0	0		0	
Enteric fever:										
Typhoid ..	0	0	0	0		3	2	0	0	
Paratyphoid ..	3	0	1 (B)	0		3	0	0	0	
Food-poisoning ..	81	14	6	0		175	29	4	0	
Infective enteritis or diarrhoea under 2 years				18	19				10	13
Measles*	30,913	3204	513	407	557	2,083	47	34	4	39
Meningococcal infection	29	2	5	1	1	20	1	4	1	3
Ophthalmia neonatorum	14	2	0	0		12	0	1	0	
Pneumonia† ..	1,532	118	474	29	52	480	43	253	5	4
Poliomyelitis, acute:										
Paralytic ..	2	0	0	0		5	1	0	0	3
Non-paralytic ..	1	0	0			3	0	2		
Puerperal fever§ ..	161	25	9	0		185	23	7	1	
Scarlet fever ..	610	34	54	14	8	1,200	34	109	30	27
Tuberculosis:										
Respiratory ..	394	33	66	10		498	62	76	15	
Non-respiratory	57	11	12	4		77	8	13	2	
Whooping-cough	688	38	54	7	42	778	58	181	2	49

DEATHS	1961					1960				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	2	0	0	0	0	1	0	0	0	0
Dysentery ..	2	0		0		1	0		0	
Encephalitis, acute		0			0		1			0
Enteric fever ..	0	0	0	0		0		0	0	
Infective enteritis or diarrhoea under 2 years	23	1	1	0	1	9	0	1	0	0
Influenza	972	73	31	33	37	42	5	1	0	2
Measles		0	0	0	1		0	0	0	0
Meningococcal infection		0	0				0	0		
Pneumonia ..	1,667	142	90	49	20	716	74	31	21	8
Poliomyelitis, acute	1	0		0	0	0	0		0	0
Scarlet fever ..	0	0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory ..	96	5	5	2	7	88	5	6	0	2
Non-respiratory		1		0	0		1	0	0	0
Whooping-cough	0	0	0	0	0	0		0	0	0
Deaths 0–1 year ..	403	40	48	17	18	367	36		10	5
Deaths (excluding stillbirths) ..	15,347	1253	958	241	293	11,880	934	712	161	196
LIVE BIRTHS ..	16,028	1335	1087	308	379	15,492	1312	1019	249	332
STILLBIRTHS ..	307	24	25			350	23	26		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

R.S.H.'s New Health Exhibition Centre

A permanent Health Exhibition Centre, described as the first of its kind in the world and designed to show the best current practice in public health, was opened by QUEEN ELIZABETH THE QUEEN MOTHER at the Royal Society of Health on March 1. In his introductory speech the Society's president, Lord COHEN OF BIRKENHEAD, said that up till now there had been no place where, under one roof, health workers and the lay public could obtain the wealth of knowledge which was now freely at their disposal. The exhibition is divided into 12 sections: water, clean air, food, public cleansing, drainage and sewerage, sewage disposal, occupational health, communicable diseases, pest control, health and welfare services, vital statistics, and radiation. These permanent displays will be supplemented from time to time by temporary ones on health subjects of current interest. The exhibition will be open to the public from March 7.

Doctors' Car-sick Children

A clinical trial of widely used and safe travel sickness remedies is being organized by the physiology department of the London Hospital Medical College. The subjects are to be doctors' children who are regularly car-sick, aged between 4 and 11, travelling on ordinary car journeys. Doctors who would like to see a detailed plan of the experiment before committing their children to take part are asked to send a postcard mentioning the number of children they have in the category mentioned above to Dr. C. L. BRAY or Mr. M. S. HALL, B.Sc., Department of Physiology, the London Hospital Medical College, Turner Street, London E.1.

Royal Society Visiting Professorship, 1961-2

Professor R. COUTEAUX, professor of animal biology, University of Paris, has been appointed Royal Society Visiting Professor for the academic year 1961–2. He is expected to take up the appointment on October 1 and work in the department of biophysics at University College London on the structure and function of neuromuscular connexions. Professor Couteaux is a histologist who has made outstanding contributions by microscopical and histochemical means to knowledge of synaptic structures.

Zoo Research in Animal Reproduction

Research work on animal reproduction to be carried out by Fellows endowed last year by a Ford Foundation grant to the Zoological Society of London (see *Journal* annotation, May 14, 1960, p. 1492) includes the following aspects of the subject:

The breeding biology of Soay sheep, which are confined to the island of St. Kilda and which present unique material for the investigation of a population of small ungulates; the reproductive performance under laboratory conditions of various forms of Apodemus; a histological and histochemical study of the intra-epithelial granular cell which occurs in the placenta of ruminants; the reproductive tracts of the giraffe; and the effects of abnormal environments on the development of the embryo, with particular reference to the inhibitory influence of the endometrium on the spread of the cells of the trophoblast.

London School of Hygiene and Tropical Medicine

The London School of Hygiene and Tropical Medicine has recently issued its *Report on the Work of the School for the Year 1959–60*. It notes that during the coming session the academic organization of the tropical side of the School will be modified to help co-ordinate the School's teaching and policy to meet the rapidly changing conditions in tropical countries, and to integrate the School's academic activities with those of overseas medical schools and research institutes. During the year 541 students attended courses in the School.

Vice-Chancellor, University of Calcutta

The appointment of Dr. SUBODH MITRA to the vice-chancellorship of Calcutta University was briefly noted in the *Journal*, January 28, p. 305.

Dr. Mitra, who was born in 1896, holds the degrees of M.B.(Cal.), Dr.Med.(Berlin), F.R.C.S.(Edin.), F.R.C.O.G., and F.N.I. He is principal of the Chittaranjan Seva Sadan College of Obstetrics, Gynaecology, and Child Health, Calcutta, and director of the Women and Children's Hospital there, of the Chittaranjan Cancer Hospital, and of the Chittaranjan National Cancer Research Centre. In the University of Medicine, Calcutta, he is head of the department of obstetrics and gynaecology, and vice-president, while in Calcutta University he is dean of the medical faculty and a member of the Academic Council and of the Senate and Syndicate. The University has awarded him its Coate's Medal for medical and scientific research, and the Asiatic Society the Berkeley Memorial Medal for outstanding contributions to medical or biological science with special reference to India. He has been a delegate or sectional president to many international congresses. His particular scientific contributions have been in the fields of toxaemia and anaemia of pregnancy and the surgery of uterine cancer. He is the author of a new operative technique for cancer of the cervix, which is described in his monograph *Mitra Operation for Cancer of the Cervix* (1960).

Food Standards Committee and Food Labelling

The Food Standards Committee is to undertake a review of the labelling provisions of the Labelling of Food Order and of other food regulations. They will not, however, at present be concerned with provisions relating to advertisement. The committee would welcome written evidence from interested organizations on any matters coming within the scope of this review, and such evidence should be sent to the Joint Secretary, Food Standards Committee, Great Westminster House, Horseferry Road, London S.W.1, by May 4. Points in which the committee is particularly interested include the extent to which the presence of chemical additives should be declared on labels, and whether the labelling provisions on tonic, restorative, medical, vitamin, and mineral claims need amendment.

Sterile Supplies for Hospitals

The Central and Scottish Health Services Councils have appointed a Committee on Central Sterile Supply Departments with the following terms of reference: to consider and advise on (*a*) the policy which should be followed on the provision of central sterile supply services in National Health Service hospitals, (*b*) the organization and control of central sterile supply departments. Members appointed by the Central Health Services Council include Sir STANFORD CADE, Dr. E. M. DARMADY, Professor A. S. DUNCAN, Professor E. A. PASK, and Dr. J. REVANS. Those appointed by the Scottish Health Services Council include Professor J. W. HOWIE and Dr. CAMERON WEYMES. The secretary is Mr. E. L. WALLIS, Ministry of Health, Savile Row, London W.1.

Polio Research Fund Grants

The National Fund for Research into Poliomyelitis and Other Crippling Diseases has made grants totalling £59,447. The major ones are as follows:

Nuffield Orthopaedic Centre, Oxford, £10,500 (to finance developments of special aids for upper limb); Department of Medicine, Sheffield University, additional £6,255 (for work in virology); Department of Bacteriology, University College Hospital Medical School, £5,660 (for one-year research fellowship in virology); Department of Microbiology, Hospital for Sick Children, Great Ormond Street, £2,617 (to finance first year of three-year project on encephalitis); Christian Medical College and Hospital, Vellore, S. India, £18,000 (towards enlarging and equipping department of physical medicine, including provision of salaries for technicians, to aid leprosy research programme); Department of Microbiology, Queen's University of Belfast, additional £11,000 (for veterinary and other studies concerned with poliomyelitis).

Townsville University College, North Queensland

Townsville University College was officially opened on February 27 in North Queensland. It has been built at a cost of £A200,000 on a 35-acre site, and will provide courses in medicine, law, arts, education, commerce, science, and agricultural science. It has an initial enrolment of 76 day and 49 evening students. The nearest university hitherto has been the Queensland University in Brisbane, more than 800 miles to the south.

Hong Kong's Queen Elizabeth Hospital

Constructional work is to start in May on the main building of the £3,750,000 Queen Elizabeth Hospital in Hong Kong. The hospital will have 1,320 beds and will include a surgical unit of 31 wards and 18 operating theatres. There will be a radiological department, financed by the Royal Hong Kong Jockey Club, and known as the Jockey Club Radiological Institute.

Survey of Deafness in Africa

The Nuffield Foundation and the Colonial Office are co-operating in sponsoring a survey of deafness in some Commonwealth countries of Africa, with special reference to young children. As a preliminary to this survey, Professor F. C. ORMEROD (professor emeritus of laryngology and otology at London University, and director of research at the Institute of Laryngology and Otology) and Mr. A. A. SHILLINGFORD (formerly chief adviser on education to the Federal Government of Nigeria) are visiting Kenya, Uganda, and Tanganyika. Plans for the main survey of deafness in East, Central, and West Africa are now being made.

People in the News

The Prime Minister of Australia will visit the Royal College of Obstetricians and Gynaecologists on March 15, when he will be admitted to the Honorary Fellowship of the College.

Mr. Macmillan has invited his physician, Sir JOHN RICHARDSON, to accompany him on his tour of the West Indies at the end of March.

COMING EVENTS

"Materials and Finishes in Modern Hospital Building."—Exhibition organized by Ministry of Health, Regional Hospital Boards, and others connected with hospital building, March 10 to April 8, 9.30 a.m. to 5 p.m. (Saturdays 1 p.m.), except Easter, Building Centre, 26 Store Street, London W.C.1.

Royal College of Obstetricians and Gynaecologists.—Scientific meeting, "Recognition and Treatment of Foetal Abnormality," March 24, 9.55 a.m., in the Nuffield Hall of the College. Registration (£1) forms from Secretary, 27 Sussex Place, Regent's Park, London N.W.1.

Cambridge University Medical School, and East Anglia Faculty, College of General Practitioners.—March 25: Symposium, exhibition, "The Consulting Rooms," "The Country Practice," "Syringes," "Appointment Systems," "Record Keeping"; March 26: exhibition, lectures, Department of Human Ecology, Fenner's, Gresham Road, Cambridge. Details from, and bookings to, Secretary of Medical School, Tennis Court Road, Cambridge, by March 18.

Association of Surgeons of Great Britain and Ireland.—Annual meeting, Bristol, April 6–8. Details from A.S.G.B.I., 47 Lincoln's Inn Fields, London W.C.2.

British Occupational Hygiene Society. — Conference, "Training in Occupational Hygiene," April 11, Birkbeck College, Mallet Street, London W.C.1. Registrations (21s.) to Mr. J. STEEL, Department of Industrial Health, Medical School, King's College, Newcastle upon Tyne.

"Recent Developments in the Sterilization of Surgical Materials."—Symposium organized by the Pharmaceutical Society in collaboration with Smith and Nephew Research Ltd., April 11–13, School of Pharmacy, London University, Brunswick Square, London W.C.1. Admission by ticket. Details from the Department of Pharmaceutical Sciences, the Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London W.C.1.

Queen's Institute of District Nursing.—Open conference, "Central Sterile Supply Services and their Application to District Work." April 19, 2.30 p.m., Great Hall, Caxton Hall, Westminster, London S.W.1. Speaker: Dr. E. M. DARMADY. Details from Institute, 57 Lower Belgrave Street, London S.W.1.

Department of Psychological Medicine, Royal Free Hospital.—Refresher course in psychological medicine for general practitioners, under auspices of Postgraduate Medical Federation, April 22, 23, and May 6, 7. Details from Dr. A. ELITHORN, Royal Free Hospital, Gray's Inn Road, London W.C.1.

"Rehabilitation of the Amputee." — Course for orthopaedic consultants and senior registrars, May 1–5. Applications to the Principal Medical Officer, Artificial Limbs and Appliances, Queen Mary's (Roehampton) Hospital, Roehampton, London S.W.15.

NEW ISSUES OF SPECIALIST JOURNALS

*The journals listed below are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London W.C.*1.

ARCHIVES OF DISEASE IN CHILDHOOD

A Longitudinal Study of the Growth and Development of Prematurely and Maturely Born Children. Part VI. Cecil Mary Drillien.
Disorders of Spoken Language in Young Children. Mary D. Sheridan.
The Natural History of Infantile Spasms. P. M. Jeavons and B. D. Bower.
The Effect of Corticotrophin and Prednisolone on Infantile Spasms with Mental Retardation. B. D. Bower and P. M. Jeavons.
The Reproductive Histories of Mothers of Patients Suffering from Congenital Diplegia. T. T. S. Ingram and Elspeth M. Russell.
Antenatal Stress and the Baby's Development. J. H. Abramson, Ansuyah R. Singh, and Victoria Mbambo.
The Puff Test. John Rendle-Short.
A Survey of a Group of Children with Mental and Physical Handicaps Treated in an Orthopaedic Hospital. E. P. Quibell, Elspeth Stephen, and Elizabeth Whatley.
Observations on the Clinical Course and Treatment of 100 Cases of Still's Disease. B. E. Schlesinger, C. C. Forsyth, R. H. R. White, J. M. Smellie, and C. E. Stroud.
Serological Investigations into Sequelae of Scarlet Fever with Particular Reference to Rheumatic Fever. Nikolai Popov.
Functionally Active Intrathoracic Neuroblastoma. R. Abbey Smith, T. P. Whitehead, Lorna Morris, and H. Parry Williams.
A Familial Tubular Absorption Defect of Glucose and Amino Acids. Wilfrid Sheldon, Joseph Luder, and Brian Webb.
Cerebellar Hypoplasia in Werdnig-Hoffmann Disease. R. M. Norman.
Diffuse Progressive Interstitial Fibrosis of the Lungs in Childhood (Hamman-Rich Syndrome). H. B. Hilton and John Rendle-Short.
Intracranial Complications of Leukaemia Treated with Intrathecal Amethopterin. Bernard M. Laurance.
Book Reviews.

Volume 36, No. 185. (Bi-monthly; £4 4s. annually.)

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, March 13

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Major-General R. Drew: The Rickettsial Diseases.
ROYAL SOCIETY OF ARTS.—6 p.m., Cantor Lecture on Modern Photography by Mr. C. E. Engel, F.I.B.P.: Photography in Medicine.

Tuesday, March 14

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—At 36 Harborne Road, Edgbaston, 8 p.m., Professor F. Lafitte: Family Planning.
INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 3 p.m., Professor Lee Buxton (Yale): Investigation and Treatment of Irregular and Profuse Menstruation and Abnormalities of Ovulation.
LISTERIAN SOCIETY.—At Lecture Theatre, King's College Hospital Medical School, 8.30 p.m., Presidential Address by Mr. Harland Rees.
LIVERPOOL UNIVERSITY: FACULTY OF MEDICINE.—At Liverpool Medical Institution, 4.45 for 5.15 p.m., jointly with Liverpool Medical Institution and Medical Students' Society. History of Medicine Lecture by Mr. Hugh Reid: Life and Times of Andreas Vesalius.
MANCHESTER MEDICAL SOCIETY: SECTION OF SURGERY.—At Clinical Sciences Building, York Place, 7.30 for 8 p.m., Mr. F. G. Ralphs: Gastrointestinal Granuloma; Mr. N. F. Kirkman: Acute Appendicitis, Diagnosis and Findings.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Lecture Theatre, Wright-Fleming Institute, 5 p.m., Mr. Aleck Bourne: Gynaecology of Old Age.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. J. N. Milnes: clinical demonstration in neurology.

Wednesday, March 15

CHILTERN MEDICAL SOCIETY.—At Beechtree Hotel, Beaconsfield, 8 for 8.30 p.m., symposium: Mental Health Act, and Current Psychiatric Problems.
CHRISTIAN MEDICAL FELLOWSHIP.—At Royal Commonwealth Society, Northumberland Avenue, London W.C., 7.45 for 8.15 p.m. Mr. W. Melville Capper: Questions Colleagues Have Asked Me.
FACULTY OF ANAESTHETISTS: ROYAL COLLEGE OF SURGEONS OF ENGLAND.—4 p.m., Frederic Hewitt Lecture by Dr. R. P. W. Shackleton: In My End is My Beginning.
HARVEIAN SOCIETY OF LONDON.—At 11 Chandos Street, W., 7.30 for 8.15 p.m., Harveian Lecture by Sir Zachary Cope: My Medical Casebook for 1905.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Dyskeratosis.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. I. S. Longmuir: Effect of Temperature on Diffusion and Chemical Kinetics in Biological Systems.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. J. D. Fergusson: Cysts of the Kidney.
MIDLAND MEDICAL SOCIETY.—At General Hospital, Birmingham, 8.30 p.m., clinical meeting.
●NEW HEALTH SOCIETY.—At Ivanhoe Hotel, Bloomsbury Street, London W.C., 5.30 p.m., Showing of Health Films. Introduced by Major C. M. Kohan.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. J. F. A. McManus: Essential Renal Lesion of Chronic Pyelonephritis.
ROYAL FREE HOSPITAL, Gray's Inn Road, London W.C.—5.15 p.m., Professor Jean Hamburger (Paris): Renal Transplantation.
WILLESDEN GENERAL HOSPITAL MEDICAL SOCIETY.—At Department of Physical Medicine and Rheumatism, 8.30 p.m., Dr. A. C. Boyle: Less Common Forms of Arthritis.

Thursday, March 16

ASSOCIATION OF CLINICAL BIOCHEMISTS: SOUTHERN ENGLAND AND SOUTH WALES REGION.—At Lecture Theatre, Royal Free Hospital Medical School, Hunter Street, London W.C., 7.30 p.m., Professor H. B. Collier: Recent Advances in Red Cell Chemistry.
BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., Treatment of Carcinoma of the Cervix by Super-voltage Radiation. Speakers, Dr. Gilbert Fletcher and Mr. George W. Blomfield.
BRITISH MEDICAL ASSOCIATION.—At B.M.A. House, Tavistock Square, London W.C., 5 for 5.30 p.m., lecture-discussion opened by Dr. Maurice Partridge: The Anti-depressant Drugs.
LIVERPOOL MEDICAL INSTITUTION.—Dr. F. P. Hudson: The Dumb Blonde is My Baby (Phenylketonuria in Liverpool).
MANCHESTER MEDICAL SOCIETY: SECTION OF ANAESTHETICS.—At Staff House, Manchester University, 8 p.m., Dr. F. L. Robertshaw: Hypothermia for Cardiac Surgery—A Progress Report.
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At Royal Army Medical College Millbank, London S.W., 7.30 p.m., laboratory meeting.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. Desmond Curran: postgraduate demonstration in psychiatry.
WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Nurses' Hall, West London Hospital, 7.30 p.m., Mr. Edward Wrangham: The Sola Khumbu Expedition.

Friday, March 17

BRITISH INSTITUTE OF RADIOLOGY.—2.30 p.m., Current Topics in Isotope Techniques
CAMBRIDGE UNIVERSITY: SCHOOL OF CLINICAL RESEARCH AND POSTGRADUATE MEDICAL TEACHING.—At Radiotherapeutic Centre, 4.15 for 4.30 p.m., Dr. R. M. Maher: Relief of Pain by Spinal Injection.
GALENICALS.—At Royal Fort, Bristol, 5.30 p.m., Sir Henry Dale, O.M., F.R.S.: Royal Society of London and Medical Science—A Record of 300 Years.
●INSTITUTE OF ALMONERS.—At William Beveridge Hall, Senate House, London University, W.C., 5.30 p.m., annual general meeting. Miss E. M. Goldberg: Social Worker in the Sixties.
●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. D. Samman: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. K. E. Jefferson: clinical demonstration.
INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Chelsea Hospital for Women, 4.30 p.m., Professor Lee Buxton (Yale): Investigation of the Infertile Couple.
LIVERPOOL SOCIETY OF ANAESTHETISTS.—At Liverpool Medical Institution, 8 p.m., papers to be presented by Registrars.
LIVERPOOL UNIVERSITY: FACULTY OF MEDICINE.—At Large Lecture Theatre, New Medical School, 5.15 p.m., Mr. B. N. Brooke: Development of Blood Transfusion.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 10 a.m., Mr. L. P. Le Quesne: Pyloric Stenosis; (2) 4 p.m., Dr. Wallace Brigden: Pericarditis.

Saturday, March 18

●CAMBRIDGE UNIVERSITY POSTGRADUATE MEDICAL SCHOOL.—At Radiotherapeutic Centre, Addenbrooke's Hospital, symposium on the Adrenal and Anaesthesia. *Morning session*, 10.30 a.m., Dr. Marthe Vogt, F.R.S.: Some Aspects of Adrenal Physiology; 11.45 a.m., Dr. L. C. Martin: The Adrenal and Blood Pressure. *Afternoon session*, 2.15 p.m., Professor W. W. Mushin: Anaesthesia for Patients with Adrenal Disorders; 3.15 p.m., Dr. L. G. Whitby: Biochemical Reaction to Trauma.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Mukerji.—On February 19, 1961, at Birch Hill Hospital, Rochdale, Lancs, to Dipali, wife of Dr. Dilip Kumar Mukerji, a son—Swagatam.

DEATHS

Beaumont.—On February 12, 1961, in General Hospital, Birmingham, Dorothy May Beaumont, M.B., Ch.B.
Davis.—On February 10, 1961, at Bradfields, Stockbridge, Hampshire, Kenneth James Acton Davis, M.Ch., F.R.C.S., aged 78.
Edwards.—On February 15, 1961, at his home in Bournemouth, Charles Edwards, M.D.
Elvery.—On February 13, 1961, at Dorchester, Philip Gordon Moss Elvery, D.S.O., *M.C.*, L.R.C.P.&S.I., Lieutenant-Colonel R.A.M.C., retired.
Ghosh.—On December 12, 1960, in an accident, B. Ghosh, M.B., M.R.C.P., Lieutenant-Colonel, of 1 Church Road, Delhi, Cantt 10, India.
Goldstein.—On February 12, 1961, Rebecca Goldstein, M.B., B.S., of 69 Rossmore Court, Park Road, London N.W.
Leslie-Smith.—On February 3, 1961, Mary Addams Leslie-Smith, M.B., B.S.
Lumsden.—On February 15, 1961, at Mercia House, Lansdowne Road, Hove 2, Sussex, George Henry Charles Lumsden, M.B., Ch.B.

Any Questions ?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Morphine for Shock

Q.—*Your expert, answering*[1] *a question on emergency equipment in ambulances, suggested that morphine had no place in the treatment of haemorrhagic shock. In what situations should morphine be administered, and when is it contraindicated?*

A.—Morphine has no place in the treatment of haemorrhagic shock because in this condition the peripheral circulation is minimal. A subcutaneous injection of morphine under these conditions often stays where it is injected: sometimes the injection is repeated still without effect and for the same reason. When the blood volume of a patient in this state is restored by transfusion the two doses then become effective, and diagnosis on clinical signs and symptoms is masked. These are the reasons why the subcutaneous injection of morphine in haemorrhagic shock is contraindicated.

The situations in which morphine should be administered are when an injured person is suffering from painful wounds unassociated with significant degrees of loss of blood; when a person is mentally disturbed but uninjured; and, finally, in haemorrhagic shock when pain is a factor morphine should be given either intramuscularly or intravenously and in one dose only of no more than one-quarter of a grain.

REFERENCE

1 *Brit. med. J.*, 1960, **2**, 1615.

Dust from Swedish Hardboard

Q.—*Is there any danger in inhaling dust caused from cutting and sanding Swedish hardboard, sometimes known as masonite?*

A.—The timbers used in the manufacture of hardboard in Sweden are mainly spruce and pine, sometimes with small amounts of hardwood such as oak and beech. The dust produced in cutting and sanding hardboard is probably of smaller particle size than that from cutting and sanding the original timber, and might therefore be retained in rather larger quantities in the lung, but there is no evidence that wood dust of this kind causes any permanent pulmonary damage. However, the dust from hardboard has an irritating effect on the nose and throat in poorly ventilated workshops. It is thought that this irritation may be caused by some substances produced in the wood fibres when they are heated in the press in forming the hardboard. In some grades of hardboard additional treatment with oils or antifungicidal chemicals is carried out in manufacture, but it appears unlikely that any of these treatments result in dangerous dust being produced during sanding and cutting.

Physiological Corticosteroid Secretion

Q.—*Is there any particular method—apart from pursuing a normal, healthy, active life as we each conceive it—of stimulating and retaining the maximum physiological flow of corticosteroid hormones so as to avoid the rheumatic ills which these hormone injections in middle life relieve intermittently?*

A.—This question is evidently based on the assumption that, since corticosteroids may have a palliative effect in rheumatoid arthritis and related conditions, they should also have prophylactic value—or, alternatively, that there deficiency may predispose to rheumatism. There is certainly no evidence that the latter is true, or that rheumatic sufferers have adrenal insufficiency. The antirheumatic effects of corticosteroids are pharmacological, not physiological, actions, and appear only when supraphysiological doses are given. Moreover, corticosteroids appear to influence only the effects of the disease, not the underlying disease itself.

The consequences of long-continued high levels of corticosteroid secretion—Cushing's syndrome, in fact—are well known and, of course, highly injurious, leading eventually to malignant hypertension if unchecked. By no stretch of the imagination could it be supposed that this would be a fair price to pay for possible freedom from rheumatic disease. Nor is there much reason to suppose that such freedom could be obtained in this way.

NOTES AND COMMENTS

Sodium Citrate in Infancy.—Dr. A. OSMOND (Paediatric Unit, Dryburn Hospital, Durham) writes: While answering a question on sodium citrate ("Any Questions?" January 21, p. 223), your expert stated that in the infant of a few weeks of age "the urine will anyway tend to be alkaline." We would mention that this differs from our experience. Of the last 134 consecutive neonatal admissions to this unit, the first specimen of urine tested was found to be acid to litmus in 109 cases.

OUR EXPERT replies: I wonder whether the urine was tested immediately on being passed, or was left awhile. McCance[1] and Thomson[2] both found the urine to be usually on the alkaline side in babies of 4 days and upwards, and recent work, unpublished, supports their findings.

REFERENCES

1 McCance, R. A., *Arch. Dis. Childh.*, 1947, **22**, 200.
2 Thomson, J., ibid., 1944, **19**, 169.

Trapped Placenta after Ergometrine.—Dr. P. M. ELWIN (Bridgwater, Somerset) writes: Your expert's reply to the question about trapped placenta after ergometrine ("Any Questions?" February 4, p. 374) does not mention the Brandt-Andrews method. May I remind both the questioner and your expert that this method will nearly always be successful in such a case, provided it is used correctly, and would avoid (1) the risks of general anaesthesia, (2) pain and trauma to the patient which repeated attempts at "expression" involve, and (3) an anxious wait for both patient and doctor?

"Tumours in Children."—Professor A. C. P. CAMPBELL, Professor WILFRID GAISFORD, Dr. EDITH PATERSON, and Dr. J. K. STEWARD (Manchester) write: With regard to our article entitled "Tumours in Children" (February 18, p. 448) we greatly regret that by an unfortunate omission we have not acknowledged the help we had received from several sources. The work of the Manchester Children's Tumour Registry upon which our paper was based could not have been carried out without the important financial assistance given to us at various times by the following bodies: British Empire Cancer Campaign, Medical Research Council, Messrs. Cow and Gate Ltd. We are also grateful for assistance received from the Manchester University Rag Fund.

Collected Articles from the "British Medical Journal"

The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

Refresher Course for General Practitioners, Volume 3 (26s. 9d.).
Any Questions?, Volume 3 (8s. 3d.).

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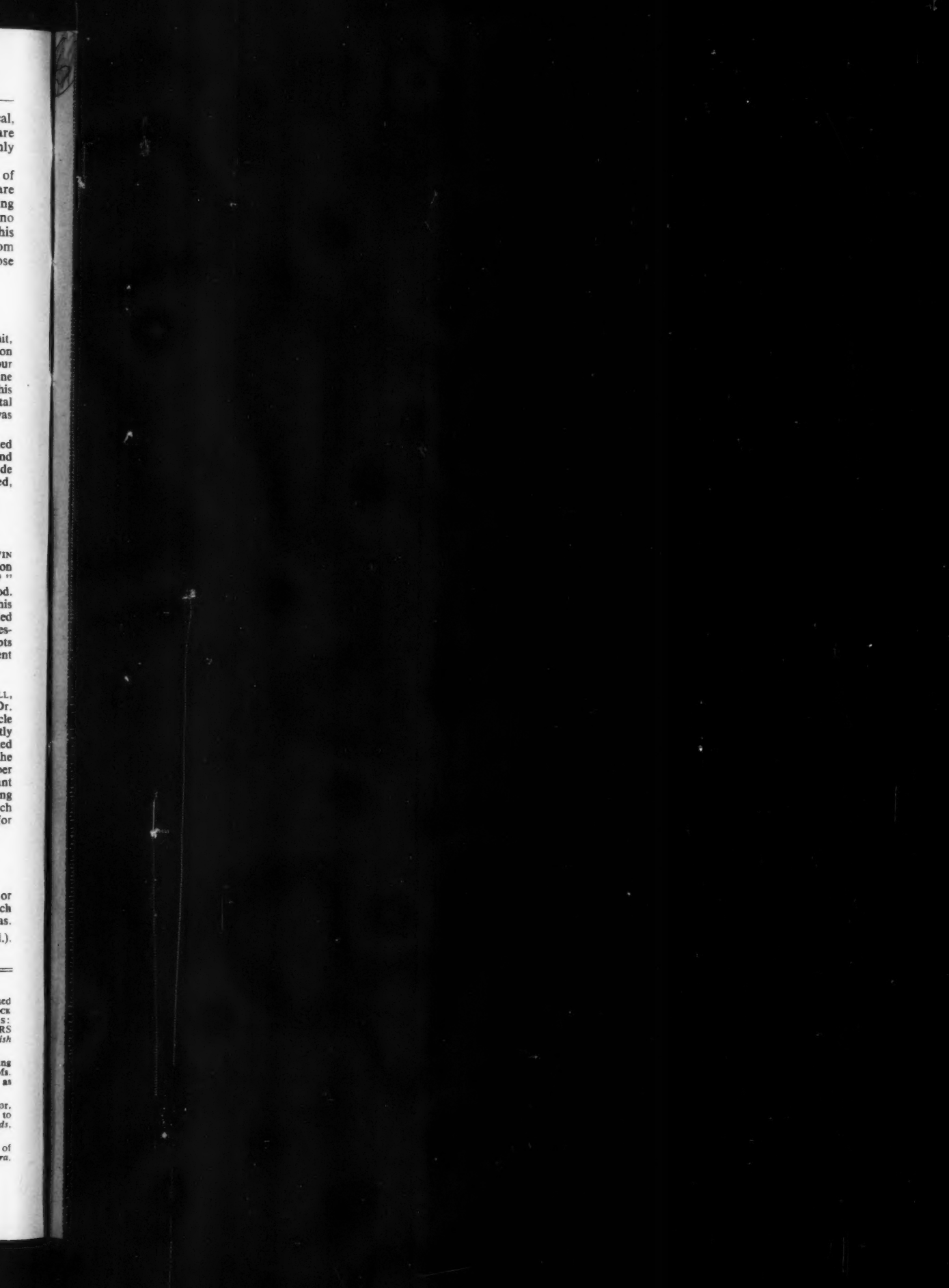
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